U.S. ARMY SIGNAL CENTER AND FORT GORDON
Fort Gordon, Georgia 30905-5180

LESSON PLAN

TITLE: Circuit Card Strapping, Location and Field
                 Application

LEARNING
OBJECTIVES: Action: The student will identify, strap
                              and install circuit cards
                              associated with designated channels
                              and terminals that interface with
                              the AN/TYC-39(A) and answer written
                              questions.

               Conditions: The student will be given an
                              operational AN/TYC-39(A), Type I,
                              Type II, and diphase loop modem
                              circuit cards, digital and data
                              adapter line termination unit
                              circuit cards, TM 11-
                              5805-790-12-1, TM 11-5805-790-12-6,
                              AN/UGC-74, AN/UGC-144, and
                              260-ASIZ2/C01-LP1-PE.

               Standard: Acceptable performance is achieved
                              when the student correctly
                              identifies type of circuit card to
                              support designated terminal, straps
                              circuit card, and installs circuit
                              card for designated channel within
                              30 minutes and correctly answers 14
                              of 20 questions within 1 hour.

SAFETY
CONSIDERATIONS: Danger - High voltages are present in this
                   equipment.

RISK
ASSESSMENT: A risk assessment has been conducted on this
                   unit of instruction and the risk level is
                   deemed to be: LOW RISK.

RESOURCE
NEEDS/
REFERENCES: Operational AN/TYC-39(A), TM 11-5805-790-12-1, TM
                11-5805-790-12-6, Type I, Type II, diphase loop
                modems, data adapter and digital line termination
                circuit cards, Overhead Projector and Slides.

METHODS OF
INSTRUCTION: Conference, Practical Exercise

TIME: 6 Hours

NOTES TO INSTRUCTOR:

1.   During validation, check this lesson closely for
      times allowed, sequence and content. Is there too
      much or not enough covered in conference? Do we
      need to add a demonstration period?

2.   Ensure all training resources are available.

3.   Ensure all safety procedures and practices are
      followed.

4.   Ensure all equipment is operational.

5.   Evaluate students on their ability to perform the
      learning objective during the practical exercise.

6.   At the end of the class, ensure all equipment is
      operational.

INTRODUCTION:

Elapsed 1.   As stated in earlier lessons, the AN/TYC-39(A)
Time   is capable of inter-operating with a wide variety
               of switches and terminal equipment. It is
               essential that you become familiar the message
               switches circuit cards, their locations, and their
               strapping options in order for these interfaces to
               pass data.

2.   This lesson will teach you the skills, knowledge,
      and procedures necessary for you to accomplish the
      task of choosing, strapping and installing the
      proper circuit cards associated with the
      designated channel and terminal mode. You will
      then practice these choosing, strapping and
      installing circuit cards until you have
      demonstrated the ability to correctly perform the
      procedures within 30 minutes.

3.   Let us begin our study by briefly reviewing line
      types, modes, and their capabilities.

BODY:

1.   Subscriber Modes and Line Types Review.

a. Modes of operation.

 (1) Modes define

  (a) Traffic capability.
  (b) Error and channel control capabilities.
  (c) Synchronous/asynchronous signaling subscribers can operate in any one of five modes.
  (d) Full-duplex/half-duplex/simplex transmission/reception.

 (2) The five MS modes available are as follows:

  (a) Mode I - full-duplex - synchronous.
  (b) Mode II - full-duplex - asynchronous.
  (c) Mode IV - simplex - asynchronous.
  (d) Mode V - full-duplex - asynchronous.
  (e) Mode VI - full-duplex - Ext Mode I - synchronous.

b. Line types.

 (1) There are the four line types that are sometimes known as TRI-TAC types because they define groupings for TRI-TAC equipment interoperability. These groupings are by:

  (a) Transmission.
  (b) Format.
  (c) Protocol characteristics.

 (2) All terminal equipment used with the MS must conform to one of the following types.

  (a) Line type I.
  (b) Line type II.
  (c) Line type III.

(d) Line type IV.

     NOTE: Show slide 3.

                    (3) Line types I and II correspond to MS
                         modes II, IV, and V.
                    (4) Line type III corresponds to mode I.
                    (5) Line type IV operates with modes I and
                         VI. Line type IV also supports data
                         adapter functions.

     QUESTION: How many line types are used to terminate
                 subscriber equipment? (ANS: Four line types
                 are used.)

     2.   Dedicated Subscriber Modem Nest.

     NOTE: Refer to TM 11-5805-790-12-1, para 1-31 and
             TM 11-5805-790-12-6, para 7-15.

          a.   Converts signals from one kind of operation
               to another.

          b.   Provides the interface between the line and
               the subscriber equipment/terminal and between
               the line and the switch.

          c.   The relationship of choosing the proper modem
               for a line and the terminal/switch must be
               considered when choosing the proper modem
               circuit card and when making data entries.

          d.   The message switch contains three types of
               loop modems:

               (1) Type I modem.

                    (a) Consists of one circuit card -
                         TYP1M.
                    (b) Type I sends and receives FSK
                         signals at a maximum rate of 150
                         baud.
                    (c) Has full-duplex capability
                         asynchronous or synchronous data
                         interface.
                    (d) Provides an analog interface
                         compatible with the TH-22 or the
                         MD-700 modem located with the
                         external subscriber's equipment.
                    (e) Inserted into right hand slot of

the three associated modem slots of the modem nest.

    (f) Modem number are assigned to channel by utilizing TGEN data base commands.

    (g) Supports line type 1 and II; mode II IV and V.

(2) Type II modem.

    (a) Consists of two circuit cards - MOD21 and MOD22 which must be manually strapped.

    (b) Has full-duplex capability; synchronous or asynchronous.

    (c) Its data modulator converts base band data into frequency shift keying (FSK) from 150 baud up to 1200 baud. It also converts to the duo binary format (2400 baud). Both are for analog transmission.

    (d) Supports line type 1, II, III; modes I, II, IV, V.

(3) Diphase loop modem.

    (a) Consists of one circuit card - DILPM.

    (b) Single channel duplex modem.

    (c) Converts digital base band to conditioned diphase signal.

    (d) Interfaces with the following devices:

        1. Digital loop encryption device (DLED).

        2. Digital subscriber voice terminal (DSVT).

        3. Another DILPM on line (subscriber) side.

(4) LKG on base band (inside switch) side.

    (a) Baud rates from 1600 to 32,000 baud (1.6k to 32K).

    (b) Supports line types II, III, IV; modes 1, II, IV, V, VI.

e. Modem Control and Status (MCS)

(1) Provides a means of exchanging status

and control information between the
modems and the intelligent line
interfaces.
 (2) Reports current condition of lines when
      a change.
 (3) Receives control information and updates
      control line of the selected modem.
 (4) Upon CIG request, reports the current
      condition of the modem status liens.

NOTE: Refer to TM 11-5805-790-12-1, para 1-31.

   f. Modem Nest.

   NOTE: Show slide 4. Refer to TM 1-5805-
          790-12-6, para 7-19. Strapping
          options will be covered later in
          this lesson plan.

 (1) Contains modem circuit cards to
      interface dedicated lines
      (loops/channels) and trunks (switch to
      switch interface)
 (2) Supports 48 interfaces - Modem 0 thru
      Modem 47.
 (3) The card nest represents how the switch
      was initially delivered. Cards may be
      moved to accommodate subscribers.
 (4) Alignment of modems must be performed by
      maintenance personnel.
 (5) Modem circuit Card address locations are
      identified by rack, row, and slot.

      (a) Rack - A23 rack.
      (b) Rows - A2 thru A5; four rows of
           modem cards.
      (c) Slots - 1 thru 41.

           1. Cards are movable and may not
               be populated exactly as map
               indicates.
           2. Middle slot is always empty.
           3. Right slot always has a card;
               type depends on terminal being
               supported.
           4. Left slot will contain a MOD22
               card if a TYPE II modem is
               used to support terminal.

 (6) Loop Modem, J-connector, Quad

relationship.

NOTE: Show slide 5. Refer to TM 1-5805-790-12-6, para 7-31.

(a)   Interface via J1077 thru SEP, connectors J11-J15.

NOTE: Show slide 6.

(b)   Modem 0 through 9

<u>1</u>.   Quads 1 through 10.
<u>2</u>.   J-Connector J11.

(c)   Modem 10 through 19

<u>1</u>.   Quads 1 through 10.
<u>2</u>.   J-Connector J12.

(d)   Modem 20 through 29

<u>1</u>.   Quads 1 through 10.
<u>2</u>.   J-Connector J13.

(e)   Modem 30 through 39

<u>1</u>.   Quads 1 through 10.
<u>2</u>.   J-Connector J14.

(f)   Modem 40 through 47

<u>1</u>.   Quads 1 through 10.
<u>2</u>.   J-Connector J15.

QUESTION: What function does the modem provide? (ANS: The modems convert signals from one kind of operation to another.)

3.   Digital line concentrator (DLC) and Intelligent Line interface (ILI) nest.

NOTE: Refer to TM 1-5805-790-12-60, para 7-24. Have students make TM corrections to rack map; renumber LTUs beginning with 0 instead of 1. LTUs should read 0 thru 47.

a.   Contains circuit cards to interface LTUs and DLCs for further interface to message processor.

b. Supports 48 dedicated or switched line
    interfaces - LTU 0 thru 47.
c. Card locations are identified by rack, row,
    and slot.

    (1) Rack - A25.
    (2) Rows - A1 thru A3; One row for DLC; 2
         rows for ILI/LTU.
    (3) Slots 1 thru 18 for row 1; slots 1 thru
         41 for rows 2 and 3.
    (4) LTUs 1 thru 47 circuit cards are movable
         and may not be populated exactly as map
         indicates. These are normally the only
         cards in this rack that are
         removed/installed by operator personnel.
    (5) Normally any other circuit cards in this
         nest should only be removed/installed by
         maintenance personnel. Improper
         procedures can cause major damage to the
         switch.

d. Digital Line Concentrator Processor.

NOTE: Show slide 7. Refer students to TM 11-5805-
       790-12-1, para 1-41 and TM 11-5805-790-12-6,
       7-24.

    (1) 32-bit microprocessor-based single board
         computer.
    (2) Responsible for the transfer of
         commands, status, and data between the
         ILIs and the automatic data processor.
    (3) Off line DLC can be used for maintenance
         and fault isolation purposes. Off line
         DLC will go on line if on-line fails.
    (4) Operator should not remove these cards.
    (5) Operators should be aware of operational
         lights and position of reset switches.
    (6) DLCA - A25A101 through A25A109.
    (7) DLCB - A25A110 through A25A118.

e. Intelligent line interface Processor (ILIP)

NOTE: Show slide 8. Refer students to TM 11-5805-
       790-12-1, para 1-38 and TM 11-5805-790-12-6,
       para 7-24.

    (1) Provides the processing and interfaces
         required to control and route data to
         and from the associated LTUS:

(a) DLC interface.
                    (b) ILI bus interface.
                    (c) Processor.
                    (d) LTU clock generator.

              (2) Contains three types of line termination
                   units:

         NOTE: Refer students to TM 11-5805-790-12-1,
                  paragraph 1-37 and TM 11-5805-790-12-6, para
                  7-24.

                    (a) Digital line termination unit
                         (DLTU).

                         1.   Card type is DLTM6.
                         2.   Provides subscriber interfaces
                              to support line types I, II,
                              and III; modes I, II, IV, and
                              V.
                         3.   Provides the line interface
                              between the loop key generator
                              (LKG) and the intelligent line
                              interface processor (ILIP).
                         4.   Transmits and receives
                              unencrypted data to and from
                              the COMSEC unit.

                    (b) Common equipment facility control
                         interface unit (CCIU).

                         1.   Provides the interface between
                              the ILIP and the interface
                              control unit (ICU) HGX-84
                              located in the common
                              equipment facility (COMSEC
                              rack).
                         2.   Consists of two circuit cards
                              - DLTM7 and DLTM8.
                         3.   Not normally installed or
                              removed by operator.

                    (c) Data adapter termination unit
                         (DATU).

                         1.   Circuit card type - DLTM9.
                         2.   A software programmable,
                              plug-in module which provides
                              a data interface between the

character oriented ILIP and a bit serial line.

       3. Supports data adapter interface.

          a. Circuits that use Data adapter control mode (DACM) will require this type of LTU.

          b. Supports MS-to-CS interface, other MS trunks, and subscriber interfaces such as AN/UGC-144 that will employ data adapters.

       4. Supports line type IV; modes I and VI.

       5. DATU establishes the transmission rate, information rate, forward error correction characteristics, framing, transmission mode, and character code parameters on line type IV loops and trunks data adapter circuits.

       6. Provides service for one loop or trunk.

  f. Ten/Twelve-Volt Regulator.

  NOTE: Refer students to TM 11-5805-790-12-1, para 1-54 and TM 11-5805-790-12-6, para 7-24.

     (1) Card - -12V REG; DLC/ILI nest locations A25A219, and A25A319; Modem nest locations A23A241, A23A341, A23A441, and A23A541.

     (2) Provides for regulation/control of circuits utilizing the specific voltages.

     (3) Not normally removed, replaced, or adjusted by operator personnel. Improper handling of these circuits can cause expensive damage to switch.

  QUESTION: What are the three types of LTUs? (ANS: DLTU, CCIU, and DATU.)

  4. Time division interface group nest.

NOTE: Show slide 9. Refer to TM 11-5805-790-12-6, para 7-16.

a.   Contains circuit cards to provide timing (clocks) for various switch circuits and an interface to a circuit switch via a digital transmission group.

b.   Provides for on-line and redundant off-line data and timing circuits.

(1)   TDIM A and TDIM B.
(2)   MTG A and MTG B.

c.   Supports up to 36 active channels to a Circuit switch: 1 signaling channel and up to 35 data channels.
d.   Card locations are identified by rack, row, and slot.

(1)   Rack - A23.
(2)   Row - A1.
(3)   Slots 1 thru 41.
(4)   These cards should be populated exactly as MAP indicates. Most cards in this row are not normally removed after initial strapping and installation.
(5)   Most cards in this row are normally not removed and replaced by operator personnel. Operators may perform strapping on certain timing cards.

e.   Circuit switch interface circuit cards.

(1)   Remote transfer switch (RTS) - two-position multiple switch.

NOTE: Refer to TM 11-5805-790-12-1, para 1-21 and TM 11-5805-790-12-6, para 7-16.

(a)   Card - RTS; location A23A104 and A23A124.
(b)   Controlled by the processor through the TICAD.
(c)   Has redundant functions.
(d)   Each RTS interfaces with each GM.
(e)   The RTS places one TDIM on-line and switches the on-line GM to the coaxial (DTG) cable. The off-line

GM can then be placed on line by
processor software control.

(2) Group modem (GM).

NOTE: Refer students to TM 11-5805-790-12-1 para 1-
22 and TM 11-5805-790-12-6, para 7-16.

      (a) Card - GPMDM; location A23A107 and
A23A127.
      (b) Can transmit and receive diphase or
dipulse data.
      (c) The modem provides modulation and
demodulation.
      (d) Provides time recovery equalization
and coupling circuits.
      (e) These diphase and dipulse circuits
enable duplex transmission of
synchronous binary data between the
MS and the CS.

(3) Transmission group module (TGM).

NOTE: Refer students to TM 11-5805-790-12-1 para 1-
23 and TM 11-5805-790-12-6, para 7-16.

      (a) Card - TGMOW; location A23108 and
A23128.
      (b) Works with the trunk encryption
device (TED) to provide encryption
or decryption, timing adjustment,
and frame synchronization.
      (c) Interface thru GM to the DTG.

(4) Multiplexer/demultiplexer.

NOTE: Refer students to TM 11-5805-790-12-1 para 1-
25 and TM 11-5805-790-12-6, para 7-16.

      (a) Card - MXDMX; location A23A109 and
A23A129.
      (b) The multiplexer/demultiplexer
multiplexes (combines) and
demultiplexes (decombines) time
sharing channels to and from a
circuit switch in groups of up to
36 channels.
      (c) The mux/demux can be configured for
modulo 8 or 9 channel groups: 8,
16, 18, for modulo 8 or 9, 18, 36

for modulo 9.
  (d) Channel capacity at loop rates of 16 or 32 kbs; depends on circuit switch/message switch rates.
 (5) Trunk signaling buffer (TSB).

NOTE: Refer students to TM 11-5805-790-12-1 paragraph 1-26 and TM 11-5805-790-12-6, para 7-16.

  (a) Card - TSB; location A23A116 and A23A135.
  (b) Works with the time division interface controller (TDIC) to provide duplex signaling.
  (c) Provides coordination between CS/MS control channels assigned as channel one (common channel signaling). The TSB creates sub-channels from the overhead channel (handshaking channel) to the circuit switch.
  (d) Performs the encoding, decoding, data storage, and message formatting.

 (6) Signal Buffer Controller (SBCC).

NOTE: Refer students to TM 11-5805-790-12-1 paragraph 1-28 and TM 11-5805-790-12-6, para 7-16.

  (a) Card - SBCC; location A23A117 and A23A136.
  (b) There are two (redundant) SBCCs - either SBCC will interface with either processor.
  (c) Interfaces the processor and the TSB to perform the command channel signaling function.

 (7) Loop key generator selector.

NOTE: Refer students to TM 11-5805-790-12-1 para 1-24 and TM 11-5805-790-12-6, para 7-16.

  (a) Card NSYLK; location A23A112, A23A113, A23A114, A23A115, A23A132, A23A133, and A23A134.

(b) MS-to-CS links are LKG encrypted at
                         both ends of the DTG.
                    (c) For TDIGM channels the interface is
                         between the MUX/DEMUS circuit,
                         TICAD, and LKS via the LKG
                         selector.
                    (d) For TDIGM (DTG) channels, this is
                         done in groups of 5 LKG outputs
                         which is determined by TGEN data
                         base command HTDM (CS interface)
                         for NSYLK assignments.
                    (e) If channels are not TDIGM but are
                         normal loop channels, the outputs
                         are still in groups of five but
                         support the loop modems. The LKG
                         number would then be assigned per
                         channel using LADD commands. This
                         is the normal default when the
                         switch is powered up.
                    (f) Supports DTG LKG selection for 35
                         of the 48 data channels.

              (8) TDIGM interface control automatic delay
                   generator (TICAD).

         NOTE: Refer students to TM 11-5805-790-12-1, para
                 1-27 and TM 11-5805-790-12-6, para 7-16.

                    (a) Card - ATDLY; location A23A110 and
                         A23A130.
                    (b) There are two TICADs - one for TDIM
                         A and one for TDIM B.
                    (c) Distributes commands received from
                         the processor.
                    (d) Collects status from the circuit
                         cards in the TDIM.
                    (e) Controls the recovered clock and
                         group rate clock selection.

         f.   Clock/timing circuit cards.

    NOTE: Refer students to TM 11-5805-790-12-1 para 1-
            43 and TM 11-5805-790-12-6, para 7-16.

              (1) MTG

                    (a) The MTG provides the timing
                         reference signals for ILIs, TDIGM,
                         loop modems and CAP.
                    (b) Runs in slave or master mode.

          <u>1</u>.   Slave mode recovered timing
                  reference source from circuit
                  switch terminated on the
                  TDIGM. The CS has a more
                  accurate frequency reference
                  oscillator.

          <u>2</u>.   Master mode - the MS provides
                  its own crystal oscillator
                  reference source.

          <u>3</u>.   Two redundant MTGs; one on-
                  line; one as standby. Either
                  can interface with either
                  processor.

(2)   Control and Redundant time division
      multiplex timing switch.

    (a)   Card - MTGS4; location - A23A122
         and A23A141.
    (b)   Provides the select circuitry to
         enable the associated MTG and
         LTGs..
    (c)   Collects status information on the
         specific timing circuits.
    (c)   One card for each of the two MTGs.
    (d)   Part of the MTG.

(3)   Frequency Synthesizer.

    (a)   Card - MTGSY; location - A23A120
         and A23A139.
    (b)   Generates four frequencies required
         by the local timing generators
         (LTG).
    (c)   Part of the MTG.

(4)   Local timing generator.

    (a)   Card - LTGA; location - A23A105,
         A23A111, A23A125, and A23A131.
    (b)   There are two types of LTGs, one
         red (plain text timing) and one
         black (encrypted text timing).
    (b)   Each LTG has two cards each of
         which is strapped to reflect the
         switch loop rate.
    (c)   Part of the MTG.

(5)   Modem clock buffer

         (a) Card type - MCBM; location -
             A23A106; A23A126.
         (b) Provides buffering of the loop
             modem clocks generated by the LTG.
         (c) Part of the MTG.

     (6) Resister Termination.

         (a) Card types - RST-1, RST-3;
             locations - A23A101, A23A102,
             A23A118, A23A137.
         (b) RST-3 is used to terminate bus for
             timing select circuits.
         (c) RST-1 in slot 2 is used to
             terminate bus for modem clock
             circuits.
         (d) RST-1 in slot 18 is used to
             terminate input/output exchange
             (IOE) for processor one.
         (e) RST-1 in slot 37 is used to
             terminate IOE for processor two.
         (f) Not normally removed by operator
             personnel. Improper removal and
             replacement can cause damage to
             related circuits.

QUESTION: What are the locations of the TGMOW circuit
             cards? (Ans: Location A23108 and A23128)

  5.   Card strapping/handling.

   NOTE: Refer to TM 11-5805-790-12-6, para 7-15.

     a   Some cards are fixed and do not require
        manual strapping. However, variable cards
        have operational capabilities that can be set
        by moveable jumper straps.

   NOTE: Show slide 10.

     b. Card Strapping/installing/handling procedures
        to follow:

       (1) Use proper grounding procedures to
           prevent electrostatic damage.
       (2) Hold at edges or connector. Do not
           place hands all over card or components.
       (3) If not using card, store in proper ESD
           protective bag or box.

(4) Card is handled in bag, or with ground strap, or in rack.
(5) Install strap into proper jacks.
(6) Check for bent pins before installing card.
(7) Install in proper slots with components facing left.
(8) Do not force card into slot.
(9) Proper handling procedures prevent costly replacement of damaged cards.

NOTE: Show slide 11.

    c.   Local timing generator (LTGA) card strapping options. (TM 11-5805-790-12-6, para 7-17).

NOTE: Show slide 12.

    d.   Redundant time-division multiplex timing switch (MTGS4) cards strapping options. (TM 11-5805-790-12-6, para 7-18)

NOTE: Show slide 13.

    e.   Type I modem (TYP1M) card strapping options. (TM 11-5805-790-12-6, para 7-20)

    f.   Type II modem:

NOTE: Show slide 14.

(1) MOD21 card strapping options.   (TM 11-5805-790-12-6 para 7-21).

NOTE: Show slide 15.

(2) Type II - MOD22 card strapping options. (TM 11-5805-790-12-6 para 7-22, page 7-48)

NOTE: Show slide 16.

    g.   Diphase loop modem (DILPM) card strapping options. (TM 11-5805-790-12-6, para 7-22, page 7-48.

NOTE: Show slide 17.

    h.   Digital Line Termination Module (DLTM6) card strapping options. (TM 11-5805-790-12-6,

para 7-25)

Show slide 18.

     i.   Remote Transfer Switch (RTS) cards must be strapped J2 to J3; J5 to J6; and J8 to J9. There are no other options. (TM 11-5805-790-12-6, para 7-16, see NOTE)

QUESTION: How many straps does the redundant time-division multiplex timing switch (MTGS4) have? (ANS: The MTGS4 requires eight straps.)

    6.   Practical exercise. During the practical exercise, observe the students on their ability to perform the learning objective; coach, if necessary. Have two students work together on equipment during the practical exercise. Students awaiting or having completed hands-on training will complete the written portion of the practical exercise.

        a.   Explanation to students.

            (1) In part one of the practical exercise, you will practice identifying, strapping and installing the circuit cards associated with the designated channel and terminal. In part two of the practical exercise you will answer written questions.
            (2) When you feel confident that you can correctly identify, strap, and install the circuit card associated with the designated channel and terminal within 30 minutes, ask one of your instructors to evaluate your performance.
            (3) If you have no questions, you may start your exercise by reading and following the directions in your practical exercise.

        b.   Application by students. Perform the steps as they are sequenced in the application portion of the practical exercise.

        c.   Evaluation. Evaluate each student's ability to correctly locate the modem cards associated with the designated channel and

strap as required for the type of field
equipment that interfaces with the
AN/TYC-39(A) within 30 minutes.

4H 57M

SUMMARY:

You have now completed your training program on
locating circuit cards associated with designated
channel and strap as required for type of field
equipment that interfaces with the AN/TYC-39(A).
During your future assignments, you will be
required to perform these procedures as well as
other procedures in the operation of the MS
AN/TYC-39(A). With the skills and knowledge
learned during this training session, you will be
successful in accomplishing this task.

5H

END

This document supports Task Number 113-583-2620.

U.S. ARMY SIGNAL CENTER AND FORT GORDON
Fort Gordon, Georgia 30905-5180

LESSON PLAN

TITLE: Data Path

LEARNING
OBJECTIVE: <u>Action</u>:   The students will determine signal
                           paths, install patch cords, and
                           perform loopback testing of
                           circuits and will answer written
                           questions.

             <u>Conditions</u>: The student will be given AN/TYC-
                           39A; installed AN/UGC-144;
                           installed AN/UGC-74; TM 11-5805-
                           790-12-6; one-, two-, and three-
                           lead patch cords; and Practical
                           Exercise, 206-ASIZ2/C01-LP2-PE.

             <u>Standards</u>:   Acceptable performance is achieved
                           when the student determines the
                           correct signal path, installs patch
                           cords, and performs loopback
                           testing of circuits within a time
                           limit of 60 minutes and correctly
                           answers 7 of 10 written questions
                           within 60 minutes.

SAFETY
CONSIDERATIONS: DANGER - High voltages are present in this
                  equipment.

RISK
ASSESSMENT: A risk assessment has been conducted on this
                  unit of instruction and the risk level is
                  deemed to be: LOW RISK.

RESOURCE
NEEDS/
REFERENCES: AN/TYC-39A, AN/UGC-144, AN/UGC-74, TM 11-5805-790-
               12-6, one-, two-, and three-lead patch cords, blue
               TDIM patch plugs/cords, overhead projector and
               slides.

METHODS OF
INSTRUCTION: Conference, Practical Exercise

TIME: 8 Hours

260-ASIZ2/C01-LP2   1   APPROVAL DATE: <u>17 APR 98</u>
                                        DEVELOPER: <u>MS SULLIVAN</u>
                                        DIV. CHIEF: Jack P. Rondon

NOTES TO INSTRUCTOR:

     1.   Ensure that all training resources are available.

     2.   Ensure that all safety procedures and practices are followed.

     3.   Ensure that equipment is operational before and after class.

INTRODUCTION:

Elapsed 1.   In the last lesson, you learned the types of
Time   circuit cards and procedures for strapping and installing circuit cards in the MS.

     2.   This lesson will teach you the signal paths that interface these cards with the subscriber and patching procedures that you can use to perform loopback testing of a circuit and to reroute a signal path.

     3.   Before patching you must understand the normal signal flow of subscriber circuits. Let us begin our study by following the circuit switch TDIGM signal path from its entry at the signal entry panel (SEP) to its entry into the line termination units (LTU).

3M

BODY:

     1.   TDIGM Circuit Switch Signal Path.

     <u>NOTE</u>:   Show Slide 1. Refer to TM 11-5805-790-12-1, para 1-30 and diagram on page 1-56 and/or foldout FO1. Only tracing message data path, not clock or signaling paths.

         a.   Circuit switch digital transmission group (DTG) encrypted message signal on coaxial (CX-11230/B) cables connected to signal entry panel (SEP) connectors A41 and A42.

         b.   Enters TED/TDIM (black) patch panel (P/P) on line side of coaxial jacks (position of blue looping plugs/cords).

     <u>NOTE</u>:   Have blue TDIM cord/plug to show students.

         c.   If blue plugs are patched line to equipment, signal routes from equipment side of blue plug to RTS in A23/TDIGM row or normal

position for DTG to pass traffic. Equipment to equipment places the internal switch equipment in loopback. Line to Line places the external signal switch equipment in loopback.

NOTE: Show Slide 2. Only tracing message data path, not clock or signaling paths.

d. Signal leaves RTS and routes to group modem (GM) in A23/TDIGM row of either TDIM A or TDIM B. The RTS will select the appropriate one.

e. Signal leaves GM and routes to black transmission group module/order wire (TGMOW) in A23/TDIGM row.

f. Signal leaves black TGMOW and routes to line side of BLK TED P/P.

g. If signal has been bulk encrypted the signal leaves from equipment side of BLK TED P/P and enters a trunk encryption device for decryption of DTG.

h. If signal has not been bulk encrypted the signal bypasses the TED by a cable disconnect (behind A23/A25 rack) or by bypass patch cords at black and red patch panels.

h. Signal leaves the equipment side at the BLK TED P/P and enters line side of RED TED P/P.

i. Signal leaves from equipment side of RED TED P/P enters RED TGMOW in A23 TDIM row.

j. Signal leaves the RED TGMOW and enters the MUX/DEMUX in A23 TDIM row.

k. Signal leaves MUX/DEMUX and enters the NSYLK in A23 TDIM row.

l. LKG encrypted signal leaves the NSYLK and enters the line side of BLACK LKG P/P.

m. Signal leaves on the equipment side of BLACK LKG P/P and enters LKG which decrypts the single channel.

n. The plain text signal leaves the LKG and enters line side of RED LKG P/P.

o. Signal leaves on the equipment side of RED

LKG P/P and enters line termination unit (LTU) in A25 ILI nest.

p. For outgoing transmission, this path and process is reversed.

q. When installing a DTG (CS to MS) use TM 11-5805-790-12-6, paragraph 7-14 to install a message switch to circuit switch to set up the data path.

r. When using TDIM patching procedures use TM 11-5805-790-12-6, paragraph 7-30 to determine where in the data path a patch would be performed.

QUESTION: What connectors on the SEP are used for a DTG? (ANS: A41 & A42.)

2. Dedicated subscriber and trunk message signal path.

NOTE: Show Slide 3.

a. Dedicated terminations enter the message switch on dedicated loops or trunks via junction box connected to a 26-pair cable (twisted pair).

b. The 26-pair cable enters on the SEP connectors J11 through J15.

NOTE: Show Slide 4.

c. This encrypted signal follows a normal-through path through line and equipment jacks of the black subscriber patch panel (P/P) to enter a specific loop modem.

d. Signal leaves the subscriber p/p and enters the associated modem (Type I, Type II, diphase loop modem) in the A23 nest.

f. Of the total 48 channels, 35 route to the NSYLK for LKG selection and then route to the BLACK LKG P/P line side. The remaining 13 route directly to the BLACK LKG P/P line side.

h. Signal leaves on the equipment side of BLACK LKG P/P and enters the data base assigned LKG.

i. The plain text signal leaves the LKG and

enters line side of RED LKG P/P.

j.   Signal leaves on the equipment side of RED
     LKG P/P enters data base assigned line
     termination unit (LTU) in A25 ILI nest.

k.   For outgoing transmission, this path and
     process is reversed.

l.   When installing a dedicated channel, use TM
     11-5805-790-12-6, paragraph 7-13 to set up
     the data path.

m.   When using patching procedures for dedicated
     channels, use TM 11-5805-790-12-6, paragraph
     7-30 to determine where in the data path a
     patch would be performed.

QUESTION: What connectors on the SEP are used for
            dedicated subscriber connections? (ANS: J11
            through J15.)

            How many of the 48 subscriber channels DO NOT
            route through the NYSLK? (ANS: 13.)

3.   Communication group. Allows intercom, DSVT and
     TA-838 signals to be patched to any of the
     subscriber lines through the subscriber input
     patch panel.

NOTE: Show Slide 5. Refer to TM 11-5805-790-12-1,
        para 1-30.

a.   DSVT and TA-838 internal connections are
     normal through when the patch panel is not
     used.

     (1)   A telephone cable W137 connected to SEP
           would be the external normal entry
           point. No patch is needed when using
           this interface.
     (2)   When a patch cord is used the normal
           through connection is broken and the
           phone signal is rerouted from the
           TED/TDIM patch panel to a cable quad at
           the subscriber input patch panel.

b.   Internal switch intercom connection is normal
     through and requires no patching. The
     external intercom connection is made at SEP
     A40 connector. Normally used for on-site
     communications with other shelters.

c.   Installation of telephones and intercom is

discussed in TM 11-5805-790-12-6, paragraphs
7-9 and 7-11.

d.   Patch panel phone and intercom jacks are
discussed in TM 11-5805-790-12-6, paragraph
7-30, page 7-90.

QUESTION: How many telephones are installed in the
AN?TYC-39A? (ANS: TWO: DSVT and TA-838.)

4.   Patching procedures.

a.   Used in MS patch panels to perform loopback
tests, reroute faulty circuits, and monitor
data signals.

NOTE: Show Slide 6. Refer to TM 11-5805-790-12-6,
para 7-30.

b.   Patch Panels.

(1)   Black.

(a)   Encrypted Signals.
(b)   Subscriber, LKG, TED/TDIM.

(2)   Red.

(a)   Unencrypted Signals.
(b)   LKG, TED.

NOTE: Show Slide 7.

(1)   Subscriber input (Black) - A8, A9, A10.

NOTE: Show Slide 8.

(2)   LKG (Black) - A11 through A15.
NOTE: Show slide 9.

(3)   LKG (Red) - A26 through A30.

NOTE: Show slide 10.

(4)   TED/TDIM (Black) - A52.
(5)   TED (Red) - A51.

c.   Patch panel connections.

NOTE: Show slide 11.

(1)   Normal through.
(2)   Patching to LINE jack.
(3)   Patching to EQUIP jack.

(4) Patching to MON jack.

          d.   Patch cords/plugs.

     NOTE: Have the various patch cords available.
              Refer to TM 11-5805-790-12-6, paragraph 7-30,
              pages 7-84 through 7-94.

              (1) Single-lead patch cords - Used primarily
                   to allow loopback testing of subscriber
                   terminals and internal switch equipment
                   by connecting transmit to receive. Used
                   by switch operator especially during
                   initial installation of a channel.

              (2) Two-lead patch cords - Used primarily to
                   reroute around faulty equipment via the
                   black subscriber patch panel jacks.

                   (a) Placing one end of the patch cord
                        in the line side. The plug white
                        side in the transmit jack (T) and
                        the plug black side in the receive
                        jack (R).
                   (b) Place the other end of the patch
                        cord in the equipment side. The
                        plug white and black sides inserted
                        into the jacks in the same manner.

              (3) Three-lead patch cords - Used in LKG/TED
                   jacks. Both ends of the patch cord will
                   fit in the line side and equipment side,
                   but will only go in one way.

              (4) Blue Plug/Cord - Used to place DTG in
                   loopback or in system.

          e.   Types of patching.

     NOTE: Show slide 12.

              (1) Loopback - Allows the testing of
                   internal or external subscriber lines.

                   (a) Connect a single lead patch cord
                        from the transmit to the receive
                        jacks.

                        1.   Equipment side patch allows MS
                              personnel to perform loopback
                              commands to test internal
                              switch signal paths.
                        2.   Line side patch allows
                              subscriber to perform loopback

testing of external subscriber
equipment.

(2) Subscriber patch - Used when a signal
going through a 26-pair cable is not
received as a result of a defective
cable pair.

(a) The subscriber terminal must move
to an available J-Box QUAD;
normally a spare.
(b) At the subscriber black P/P connect
a two-lead patch cord from the
equipment side of the failed
channel to the line side of the
newly selected cable quad (pairs).
(c) The line side patch connects to the
using subscriber through the SEP.
(d) The equipment side patch connects
to original internal modem.
(e) No data base changes required or
needed.

(3) Modem patch - Used to patch around a bad
modem by patching the original signal
path to a spare modem.

(a) On the subscriber P/P, connect a
two-lead patch cord from the line
side of the defective channel to
the equipment side of an unused
modem. This patch isolates the
faulted modem from the line.
(b) On the LKG black P/P, connect a
three-lead patch cord from the
equipment side of the faulted modem
to the line side of the spare modem
selected.
(c) Signal is redirected through patch
cord to the new modem and then back
to the original circuitry.
(c) Verify new modem type and
strapping. Perform data base
command LMOD to complete the
patching for this circuit.

(4) LTU patch - Used to patch around a
defective LTU and reroutes signal to an
unused or spare LTU.

(a) On LKG red P/P (A26-A30), connect a
three- lead patch cord from the
line side (LKG) of the failing
channel to the equipment side (LTU)

of the LTU/channel selected that
has an unused or spare LTU.

(b) This patch can be used for a
dedicated or switched channel.

(c) Verify new LTU type and strapping.
Perform a LMOD command to modify
the data base.

(5) LKG patch - Used to patch around LKGs
that are defective.

(a) On the black BLK P/P (A11-A15),
connect a three-lead patch cord
from the line (modem) side of the
defective channel to the equipment
(LKG) side of an unused/spare LKG.

(b) On the red LKG P/P (A26-A30),
connect a three-lead patch cord
from the equipment (LTU) side of
the faulted channel to the line
(LKG) side of the spare channel/LKG
selected.

(c) This allows substituting of LKG
without substituting any other
equipment supporting that channel.

(d) This can be used for a dedicated or
switched channel.

(e) Perform a LMOD command to modify
the data base.

(6) TED bypass patch - Used to temporarily
bypass a TED. If a permanent TED bypass
is needed a re-cabling procedure is done
on the rear plane of racks A23 and A25.

(a) Place one end of a LONG three-lead
patch cord into the line side of
the TED/TDIGN Black P/P at the TED
to be bypassed.

1. The TED black P/P has five
holes but only three will be
used.
2. Patch cord only fits one way
into the three line/equipment
holes.

(b) Place other end of patch cord into
the equipment side of the TED/TDIGM
Red P/P (3-leads) of the same TED.

(c) This takes the TED completely out
of the circuit.

(7) MS TO MS VIA 26 PAIR CABLE - Used to

reverse polarity in one switch to
correct the transmit-to-transmit and
receive-to-receive condition caused by a
direct 26-pair cable connection.

    (a) Place one end of a two lead patch
        cord in the subscriber patch panel
        line side of the channel quad.
    (b) Reverse the plug polarity on the
        other end and place in the
        equipment side of the same quad.
    (c) Repeat for each 26-pair cabled
        trunk between the two message
        switches.
    (d) This patch is done in only one of
        the cable-connected message
        switches.
    (e) Not used if MS to MS link is over
        some other type of transmission
        media, such as radio, satellite,
        etc.

QUESTION: At the subscriber patch panel what type patch
cord is used to reroute a signal around a bad
modem? (ANS: Two-lead patch cord.)

What type patch is used to perform in house
testing of switch equipment? (ANS: Equip to
Equip T to R with a single lead patch cord)

What is the difference between RED and BLACK
signals at the patch panels? (ANS: RED is
unencrypted; BLACK is encrypted.)

   5.   Practical exercise. During the practical
exercise, observe the students on their ability to
perform the learning objective; coach, if
necessary. Have two students work together on
equipment during the practical exercise. Students
awaiting or having completed hands-on training
will complete the written portion of the practical
exercise.

   a.   Explanation to students.

    (1) Use AN/TYC-39A; TM 11-5805-790-12-6;
        AN/UGC-144; AN/UGC-74; one lead patch
        cord; two lead patch cord; practical
        exercise, 260-ASIZ2/C01-LP2-PE. In Part
        One you are required to determine the
        correct signal path, install patches,
        and perform loopback testing of selected

circuits. You will have 60 minutes to perform these tasks. In Part two of the practical exercise you will answer written questions within 60 minutes.

(2) Have your instructor evaluate your performance after each exercise has been successfully completed.

(3) If what you are required to do is not clear, ask your instructor for clarification.

b. Application by students.

(1) Using the AN/TYC-39A with AN/UGC-74 and AN/UGC-144 dedicated terminals; TM 11-5805-790-12-6; one lead patch cord; two lead patch cord; three lead patch cords; and practical exercise, 260-ASIZ2/D01-LP4-PE, the students will install patching to reroute signals and perform loopback testing of circuits.

c. Evaluation. During the practical exercise, evaluate each student to ensure they have the ability to determine the correct procedure to perform patching and loopback testing of selected signal paths within 60 minutes and are able to correctly answer 7 of 10 questions within 60 minutes..

7H 57M

SUMMARY:

In this lesson, you learned how to determine the signal path, install patches, and perform loopback testing of circuits. This will assist you in installing and checking circuits.

8H

END

This document supports Task Numbers 113-583-2617 and 113-583-2620.

U.S. ARMY SIGNAL CENTER AND FORT GORDON
FORT GORDON, GEORGIA 30905

LESSON PLAN

TITLE: Off-line Table Generation

LEARNING
OBJECTIVE: Action: The student will perform procedures
                               to create an AN/TYC-39A off-line
                               program load disk (PLD).

                Condition: The student is given
                               TM-11-5805-790-12 series, an
                               operational AN/TYC-39A, DD/HD
                               disks, and existing switch program
                               load disk (PLD).

                Standard: Acceptable performance is achieved
                               when the student can correctly
                               write a data base within 3 hours
                               and correctly validate and create
                               security and line classmark PLDs in
                               accordance with the TM within 4
                               hours.

SAFETY
CONSIDERATIONS: There are no safety considerations for this
                   lesson.

RISK
ASSESSMENT: Low.

RESOURCE
NEEDS/
REFERENCES: AN/TYC-39A, TM 11-5805-790-12 Series, Program
                Load Device, 3.5 DS/HD Diskette, MS DOS PC with
                ASCII Editor, Overhead Projector, and Slides.

METHODS OF
INSTRUCTION: Conference and Practical Exercise

TIME: 40 Hours

 INSTRUCTOR NOTES:

260-ASIZ2/C01-LP3   1   APPROVAL DATE: 17 APR 98
                                          DEVELOPER: MS SULLIVAN
                                          DIV. CHIEF: Jack P. Rondon

     1.   Ensure that the classroom is available and properly set up and that all equipment and training resources are available and in working order.

     2.   Ensure that enough technical manuals and student guides are available and account for all transparencies.

     3.   Suggest that you teach the security portion, do the hands-on for security and then teach the rest of the lesson.

INTRODUCTION:

Elapsed
Time   To successfully operate the AN/TYC-39A, you need a good working knowledge of data base commands and procedures. In this lesson, we will study the off line data base commands and data base entry procedures that are used to develop and install data circuits in the AN/TYC-39A.

2M

BODY:

     1.   AN/TYC-39A data base overview.

         a.   Constructing a data base - write a data base using the raw data provided either from cut sheets/computer sheets, network diagrams and the reference technical manuals.

         b.   Enter the data base using the VTOF utility routine.

         c.   Validate the data base and create new PLD using the TGEN job.

         d.   The AN/TYC-39A data base is broken into two sections which are created separately by different user types.

      <u>NOTE</u>:   Show slide 1.

           (1)   Security section - Created by security user type. The security section of the data base is made up of the following commands:

(a) PASS.
            (b) UCHG.
            (c) UDEL.

     (2) Line classmark section - Created by
          ADMIN/SUPE user type. The line
          classmark section of the data base is
          made up of all table generation (TGEN)
          data base commands that are not part of
          the security section of the data base.

          (a) The SSO security section does not
               get erased or affected in any way
               by commands done in the line
               classmark section and vice versa.

          (b) Both sections are written to the
               PLD via the TGEN job, but not at
               the same time since different user
               types are required.

   e. Network construction.

     (1) Initialize the AN/TYC-39A system using
          your new PLD.

   NOTE: Show slide 2.

     (2) Initialize circuits.

          (a) In-house circuit initialization
               which include card strapping, card
               population and loopback testing.

          (b) Equipment circuit initialization
               which includes COMSEC procedures
               and placing channels in service.

     (3) Verify network connectivity by sending
          and receiving traffic to all terminals
          over all lines.

   f. A variety of networks and TGEN commands will
       be discussed in this lesson. However, it is
       not within the scope of this course to
       discuss all network interfaces or command
       parameters.

2. Security data base procedures using a personal computer.

NOTE: Show slide 3.

a. A data base and new PLD can be created by using the switch VDT along with an existing PLD or initial PLD. An initial PLD contains updated software releases that is sent to all switches. An existing PLD would be one created at your switch to identify your switches unique parameters. However, you will find that using a PC to create a data base file is more user friendly.

b. Data base commands can be entered into a PC, written to a 3.5-inch high density (HD) disk into a file named: DBCMD.PCF

c. The PC requirements are as follows.

    (1) An MS-DOS type machine.
    (2) A 3.5-inch double sided, high density DD/HD floppy disk.
    (3) An editor program that produces ASCII file such as DOS-edit or multi-edit.
    (4) A separate DBCMD.PCF on separate disks should be created for security commands.

d. The file that contains the data base produced by the PC must have the following.

    (1) A file name of "DBCMD.PCF".
    (2) A carriage return and line feed at end of each line using the return key or enter key.
    (3) Commands are typed in all capital letters (CAPs) with no extra spaces at beginning or end of line.
    (4) Command lines are single spaced.
    (5) An end-of-file mark /& is placed in the file only once: at the line following the last command.

e. Once the file is saved onto a HD 3.5-inch floppy, it is then inserted into either AN/TYC-39A floppy disk drives.

NOTE: Refer to TM 11-5805-790-12-5, para 6-30.

f.   The VTOF job is used to convert the DBCMD.PCF
     file into a DBD file that is ready for TGEN.

     (1) The generate function of the VTOF job is
          used to read the PC-generated floppy
          disk and then write a DBD into a
          language the switch can understand.
     (2) The PC-generated disk cannot be read
          directly by the TGEN job; the DBD disk
          can.
     (3) The output DBD from the VTOF job is
          non-validated: command parameters are
          not verified for correctness.
     (4) A DBD floppy can be created directly
          from the VDT keyboard without a
          DMCMD.PCF floppy. However, the editors
          used with PCs should be more powerful
          and user friendly than the VTOF job
          editing procedure.
     (5) VTOF job is used to perform the
          following functions:

          (a) List an existing floppy disk and
               produce a printout of its contents.
          (b) Generate a new DBD on floppy disk
               from operator input.
          (c) Update an existing DBD, making any
               operator-directed additions or
               deletions.

     (6) VTOF job equipment requirements.

          (a) VDT.
          (b) Line printer.
          (c) Floppy disk drives.

NOTE: Show slide 4.

     (7) VTOF Operating procedure and printouts

          (a) To print, generate, or update a
               DBD, enter the following at the
               NEXT JOB prompt: VTOF.
          (b) This job is performed by user types
               SSO and administration/supervisor.
          (c) In response to the "ENTER FUNCTION
               (L=LIST, G=GEN, U=UPDATE) = ?"
               prompt, the operator responds with

one ASCII character representing the desired function.

(8) A separate DBD is developed for each section of the data base but they are done by different user types and at different times.

(9) Once a VTOF has been used to generate a DBD it is suggested that VTOF list be used to have a printout to refer to when performing validation of database when using TGEN procedures.

g. off-line TGEN procedures.

NOTE: Refer to TM 11-5805-790-12-5, para 6-37.

(1) Off-line TGEN is used to create or modify the site-specific data base security or line classmarks and to produce a new PLD containing all the programs and the newly generated/updated data base.

(2) A user type SSO is the only user type allowed to perform password procedures using TGEN.

(3) A user type ADMIN/SUPERVISOR is the only user type allowed to perform line classmark procedures using TGEN.

    (a) The TGEN function is available off-line and on-line.

    (b) Off-line and on-line TGEN commands are entered as one or two line entries.

    (c) Off-line is primarily used to create or modify the site-specific data base classmarks and produce a new PLD containing security and line classmarks.

    (d) Most procedures used in the off-line and on-line modes are almost identical. The differences for the on-line commands will be discussed in the next lesson.

(4) Equipment requirements.

    (a) VDT.

     (b) Printer (optional).
     (c) Two floppy disk drives.

       <u>1</u>. One for the current PLD and
         one for a formatted floppy
         which will become the updated
         PLD.
       <u>2</u>. One of these drives must also
         be used for the DBD if
         commands are to be input from
         floppy; however, once the DBD
         read is complete, this drive
         can be used for one of the PLD
         functions.
       <u>3</u>. The function names are:

         <u>a</u>. IPLD - PLD disk that has
           existing data on it.
         <u>b</u>. OPLD - Disk that can be
           overwritten, normally
           blank.
         <u>c</u>. IDBD - Disk that has non-
           validated data: DBD file.

   (5) TGEN input procedures for security
     classmarks.

 <u>NOTE</u>: Show slide 5.

     (a) The job ID is "TGEN" is entered at
       the NEXT JOB prompt.
     (b) Procedures to enter TGEN may
       require existing functional
       passwords.

       <u>1</u>. If the master password is
         entered, Mxxxx$ no other
         password is normally required.
       <u>2</u>. Exception: If a PASS command
         is on the DBD or will be
         entered at the VDT one or more
         of the existing/current
         functional passwords will be
         required when changing the
         value of one or more of these
         existing passwords; that is,
         rather than to define a
         password for the first time.
       <u>3</u>. During this lesson we will
         concentrate on DBD input to

TGEN in lieu of VDT input.
The VDT input will be taught
in more detail in the next
lesson.

(6) The ACK response line to a TGEN command
is displayed on the VDT and printer. It
will contain the data base command
numbers assigned as a result of the
commands processed.
(7) TGEN error indications.

(a) Command errors are indicated on the
printer and VDT screen (in addition
to the SUPE NAK).

NOTE: Show slide 6. Refer to TM 11-5805-790-12-5
para 6-40.

(b) Line 1 is simply the command in
which the error is detected, with
any passwords overlaid with dollar
signs ($).
(c) Line 2 contains a single asterisk
(*) in the character position at
which the command scan first
detected an error.

1. The asterisk position can
indicate a problem with the
field it is under, with a
previous field, or indicate a
missing field.
2. An asterisk beneath character
one of the command means that
the error was not noticed
until after all the fields
were scanned.

(d) Line 3 consists of a brief message
describing the type of error and
the number of the record in error
if DBD input.
(e) At this point a correction can be
made, a new command entered, or a
return to the original input
device, DBD/VDT, for validation of
more commands.
(f)   If
corrections are not made, the

command will not be contained in
the new PLD.

h.   Security command formats for DBCMD.PCF.

(1) PASS - This command is allowed if and
     only if the master password is given
     when entering TGEN.

     (a) Password Values - Any printable
          ASCII except $. At least one
          password is required in the
          command.
     (b) Password defaults to current value.
     (c) Passwords change allowed - If, and
          only if, the old value of this
          password is given when entering
          TGEN or if the password has not yet
          been defined such as from an
          initial PLD.
     (d) Command format - PASS Mxxxx$ Sxxxx$
          Exxxx$ Yxxxx$ Dxxxx$ Axxxx$ Txxxx$
          Xxxxx$ Jxxxx$ where:

          1.   Mxxxx$ - New master password.
          2.   Sxxxx$ - New security change
               password.
          3.   Exxxx$ - New ECP change
               password.
          4.   Yxxxx$ - New print high
               security text password.
          5.   Dxxxx$ - New dump password.
          6.   Axxxx$ - New allied/US
               password.
          7.   Txxxx$ - New TRC change
               password.
          8.   Xxxxx$ - New SPECAT/SHD change
               password.
          9.   Jxxxx$ - New DATE/TIME change
               password. This password can
               be added off-line on an
               initial PLD only. Cannot be
               changed off-line on existing
               PLD.

(2) UCHG - This command adds or changes the
     user ID and password of a given user.

     (a) All user IDs and passwords must be

unique (no ID or password may be used more than once).

(b)   Command format - UCHG xxxx yyyyyyyy$ t aaa eee where:

1.   xxxx - User ID. Used to identify a specific user. VALUES: Four ASCII printable characters. ALLOWED: Yes. REQUIRED: Yes. DEFAULT: N/A.

2.   yyyyyyyy - User password provides a means of controlling discretionary access to the system. VALUES: Eight ASCII printable characters. ALLOWED: Yes. REQUIRED: Yes. DEFAULT: N/A.

3.   t - User type code. VALUES: S = SSO; T = Traffic Service; A = ADMIN/SUPE; M = Maintenance. ALLOWED: Yes. REQUIRED: Yes. DEFAULT: N/A.

4.   aaa - Activation date. The Julian date that the user ID and password become effective. If day is less than current day, activation date is in following year. VALUES: 1 to 366. ALLOWED: Yes. REQUIRED: Yes. DEFAULT: N/A.

5.   eee - Expiration date. The Julian date that the user ID and password become ineffective (deleted). If day is less than activation date, expiration is for year following activation. VALUES: 1 to 366. ALLOWED: Yes. REQUIRED: Yes. DEFAULT: N/A

(3)   UDEL - This command will delete a user ID and associated password from the user ID table.

(a)   If a changes are to be made to an existing user such as change in expiration date UDEL should be used to delete the user before using UCHG.

(b) The password tables can only
    contain 20 user IDs. If new IDs
    need to be added, UDEL may be
    required to delete some old ones
    before UCHG can be used.
(c) Command format -UDEL xxxx where:

    1. xxxx - User ID.
    2. The four-character user ID
        that identifies the user that
        is to be deleted. This may
        not be the last SSO user ID.
        VALUES: Four ASCII printable
        characters. ALLOWED: Yes.
        REQUIRED: Yes. DEFAULT: N/A.

`   (4) DBCMD.PCF sample file.

NOTE: Show slide 7.

        (a) PASS command to change all
             functional passwords except date
             password.
        (b) UCHG to add a new security ID.
             Contains no errors.
        (c) UCHG to add a new security ID.
             Contains at least one error; $ was
             left off of the password.
        (d) This file would be placed on a PC
             floppy and VTOFed in the switch to
             a DBD disk which would be used with
             TGEN to create a PLD.

    i. Initial PLD generation.

NOTE: Show slide 8.

        (1) An initial PLD will not contain quite
             the same information as an existing PLD.
             This PLD has no database and a security
             database must be applied. These new
             software releases are fielded with a
             procedures manual and a password that
             will be used to help create your site
             specific password and line classmark
             PLD.

        (2) The initial PLDs contain:

             (a) A master password of MTEMP$.

(b) A user ID and password of "ISSO"
     and "PASSWORD$".
(c) These are the normal functional and
     user passwords issued with a new
     release. Be aware that these could
     change and would be included with
     your instruction booklet that comes
     with your initial PLD.

(3) An initial PLD allows you to perform the
     following jobs:

(a) MSLD - Reloads standby processor
     with PLD.
(b) LFIM - M&FI software package.
(c) LGON - You can only log on when
     using the initial PLD with supplied
     security user ID.
(d) TGEN.

(4) After you log on as the supplied ISSO
     user, enter TGEN to perform security
     procedures.

(a) Enter TGEN to perform the following
     commands:

     1. PASS - Required to define a
         new master password other than
         the supplied MTEMP$.
     2. UCHG:

         a. At a minimum define at
             least one new security
             user ID and password
             other than ISSO and
             PASSWORD$.
         b. It is also suggested that
             at least one ADMIN/SUPV
             user be defined at this
             time. If needed more
             users may be entered at
             this time.
         c. The MTEMP$ master
             password and the ISSO
             user are not copied to
             the new PLD. Your new
             security PLD contains
             only what you defined
             during your initial TGEN

job.

        (b) During this initial TGEN, the information can be entered at the video display terminal (VDT) or from database device (DBD).

        (c) To activate the new PLD perform MSLD or initialization of the switch with dinled disks. Other jobs may now be performed such as: printing password tables or creating line classmarks PLD.

NOTE: You may have the students perform the security officer portion of the practical exercise before continuing with the line classmark conference. See paragraph 4 of this lesson plan for practical exercise instructions.

3.   AN/TYC-39A Admin/Supervisor line classmark procedures.

NOTE: Show slide 9. Refer students to term listing at end of practical exercise for definition/explanations of some line classmark parameters used with the TGEN commands.

a.   A line classmark TGEN database is entered only by the ADMIN/Supervisor.

b.   If TGEN is entered by a user type ADMIN, then TGEN only accepts nonsecurity (line classmark) data base commands.

c.   Sometimes TGEN is ran twice - once for user type SSO and once for user type ADMIN.

d.   The two sections of the data base do not overlap each other.

        (1) Security commands are separate from line classmark commands.

        (2) The line classmark "H T" command will initialize all the line classmark tables but does not initialize the security command tables.

e.   Line classmark commands are used as needed or

as required by the network. If a command is
not necessary, it need not be entered.

      f.   To create a line classmark PLD, the same
            procedures used to create a security PLD are
            used.

<u>NOTE</u>:   Show slide 10.

      (1)   Create a line classmark file DBCMD.PCF
              at a personal computer. Even though
              TGEN commands may be entered directly
              from the VDT, we will discuss and use
              the PC file procedure during this
              lesson.
      (2)   VTOF using DBCMD.PCF disk to create a
              DBD disk.
      (3)   VTOF list of DBD disk.
      (4)   Use TGEN with an existing PLD or newly
              created security PLD to validate DBD
              disk, make corrections to any errors
              encountered and create PLD combining
              security and line classmarks into one
              PLD.
      (5)   Reload PLD to formatted SDUs or use MSLD
              to change active program in processor.

<u>NOTE</u>:   Show slide 11.

      g.   It would be great if the system or network
            planner created your PC file for you. This
            may not happen and you will need to know how
            to interpret site diagrams, sometimes
            required to as bubble charts. Also you will
            need to interpret given terminal/trunk
            characteristic worksheets. Using this
            information you can create a workable
            database.

      h.   To define a new switch data base, a typical
            order of commands would be as follows.

<u>NOTE</u>:   Show slide 12.

      (1)   PASS (security section - SSO) -
              Define/change passwords.
      (2)   UCHG (security section - SSO) - Change a
              user ID.
      (3)   H T - Set basic switch parameters.
      (4)   HCSP (if circuit switch interface) - Set

CS interface parameters.
          (5)   HCPU (if circuit switch interface) - SET
                CS busy delay parameters.
          (6)   HEQP - Set switch equipment parameters.
          (7)   HTDM (if TDIM in system) - Define
                TDIM/NSYLK parameters.
          (8)   HMCB (home switch relays required) -
                Assign AN/TYC-39A relays.
          (9)   HXTS - Specify external traffic service.
          (10) HRYR (if switch serves Y community) -
                Change the R/Y ratio.

    NOTE: Show slide 13.

          (11) LADDs - Define new line classmarks.
          (12) SEC TRAs (R/U community) - Add TRC
                authorizations.
          (13) SEC SRA LINEs (R/U community) - Add
                SPECAT/SHD authorizations.
          (14) RADDs for relays - Define new RI
                classmarks.
          (15) RADDs for SMRIs - Define new RI
                classmarks.
          (16) RADDs for other RIs - Define new RI
                classmarks.
          (17) LRISs - Assign special RIs to a line.
          (18) SEC TCAs (Y community) - Add TCC
                authorizations.
          (19) SEC SRA RIs (R/U community) - Add
                SPECAT/SHD authorization.

    NOTE: Show slide 14.

          (20) SEC SRA TSS (R/U community) - Add
                SPECAT/SHD authorization for TS.
          (21) CADDs - Define a new connective RI.
          (22) CARIs - Add members to a collective RI.
          (23) CDRT - Define critic deterministic
                routes.
          (24) CSSTs - List RIs to receive supervisory
                STAT messages.
          (25) CDSP - List RIs to receive data base
                display messages.
          (26) CRRP - List RIs to receive network
                control routine reports.
          (27) REINs - Add/delete reintroduction RIs.

      i.   Line classmark data base command types. The
            data base commands may be looked at in seven
            general areas.

NOTE: Show slide 15. Refer to TM 11-5805-790-12-5
        para 6-41.

    (1)   Switch parameter commands - Commands
          that define switch wide types of
          parameters
    (2)   Line commands - Commands that define
          individual lines of different types.
    (3)   RI commands - Commands that define
          routing indicators.
    (4)   Collective commands - Commands that
          define collective RIs.
    (5)   Security definition commands - Commands
          that define security.
    (6)   Reintroduction commands - Commands that
          define reintroduction RIs.
    (7)   Miscellaneous commands - Commands that
          define CRITIC routes and RIs for network
          control functions.

  j.   TGEN Line classmark formats for DBCMD.PCF.

    (1)   Selected commands and formats parameters
          will be discussed in typical order of
          entry if possible. It is not within the
          scope of this course to discuss in depth
          all commands or all possible entries.
          This lesson will give you a basic
          knowledge of command entry that should
          carry over when using other commands or
          creating databases for a variety of
          networks.

NOTE: Show slide 16. Refer to TM 11-5805-790-12-5,
        para 6-43n.

    (2)   H T - Set basic switch parameters.

        (a)   First command.
        (b)   Initializes line classmark data
              base and is only allowed off-line.
        (c)   If used this command initializes
              line classmarks tables: resets
              tables to zero or default values.
        (d)   Not a required command if switch
              parameters on existing PLD are not
              to be changed or if resetting of
              tables is not needed.
        (e)   Error in TM, page 6-57, states that

this command clears password
tables. H T does not clear any
password tables.
    (e)   H T Cxxx SWITCHnnn TDLSnn where:

        <u>1</u>.   H T - Command Mnemonic.
        <u>2</u>.   Cxxx - Communities served by
this switch. VALUES: R and U
required; Y optional.
ALLOWED: Yes. REQUIRED: Yes.
 DEFAULT: N/A.
        <u>3</u>.   SWITCH nnn - Switch number.
VALUES: 1 through 126.
ALLOWED: Yes. REQUIRED: Yes.
 DEFAULT: N/A.
        <u>4</u>.   TDLSnn - Loop speed for TDMX
lines in KB/second. VALUES:
 16 or 32. ALLOWED: Yes.
REQUIRED: No. DEFAULT: 32.

<u>NOTE</u>:   Show slide 17. Refer to TM 11-5805-790-12-5,
para 6-43j.

    (3)   HCSP - Sets up interface to CS.

        (a)   Defines phone number for home
switch: the AN/TYC-39A for which
you are creating a line classmark
data base.
        (b)   Command only needed if interfacing
a CS switched network.
        (b)   HCSP Innn Nn/Nnn/Nnnn Pnnnn aaa
where:

           <u>1</u>.   HCSP - Command mnemonic.
           <u>2</u>.   Innn - International Access
Code. IAC for US forces is
914.
           <u>3</u>.   Nn/Nnn/Nnnn - National Area
Code or Sub area Code.
           <u>4</u>.   aaa - Subscriber address.

<u>NOTE</u>:   Show slide 18. Refer to TM 11-5805-790-12-5,
para 6-43i.

    (4)   HCPU - Sets circuit switch busy delay
parameters.

        (a)   If the message switch is dialing
the CS lines and a busy signal is

received, a redial is performed
according to time limit parameters
set in this command.

(b) This command has preset defaults.
H T does not reduce parameters to
zero.

(c) Only enter the command in line
classmark database if changes are
to be made from original defaults.

NOTE: Show slide 19. Refer to TM 11-5805-790-12-5,
para 6-43k.

(5) HEQP - Set switch equipment parameters.

Command Format: HEQP VDT=Axx LPU=Ax
TDIM=x TEDS=xxx TSB=x where:

1. VDT=Axx - VDTs in system.
   VALUES: B, C, or spaces and
   VDT A must be present.
   ALLOWED: Yes. REQUIRED:
   No.DEFAULT: Current value.

2. LPU=Ax - LPUs in system.
   VALUES: Must be B or space,
   LPU A must be present.
   ALLOWED: Yes. REQUIRED: No.
    DEFAULT: Current value.

3. TDIM=x - TDIMs in system.
   VALUES: Y or N; must be Y if
   circuit switch interface or
   TDMX lines to be defined. N
   implies TEDs and TSBs not in
   system. ALLOWED: Yes.
   REQUIRED: No. DEFAULT:
   Current value.

4. TEDS=xxx - TED connectivity.
   VALUES: Must be three entries,
   each = A, B, Y, or N. First
   entry for TED 1, second for
   TED 2, and third for TED 3. A
   = Connected to TDIM-A. B =
   Connected to TDIM-B. Y = In
   system, not connected. N =
   Not in system. ALLOWED: If
   TDIMs in system. REQUIRED:
   No. DEFAULT: Current value.

5. TSB=x - TSBs in system.
   VALUES: Y or N. ALLOWED:
   If TDIMs in system. REQUIRED:

No. DEFAULT: Current value

    (6) HTDM - Used to define the TDIM/NSYLK parameters when interfacing a CS over a DTG.

        (a) This command is permitted only if a TDIM was marked in system via the HEQP command.

        (b) Command format: HTDM CH=nn CLD=x CLM=x RED/BLACK REP=Y/N DIPHASE/DIPULSE RTS=A/B NSYL=xxxxxxx where:

            1. HTDM - Command mnemonic.

            2. CH=nn - Number of channels for output to circuit switch. VALUES: 8, 9, 16, 18, 32, 36. ALLOWED: Yes. REQUIRED: Yes. DEFAULT: N/A.

            3. CLD=x - Cable length demodulation (in quarter miles) and loopback information. VALUES: 0 = 0 mile, 1 = 1/4 mile 2 = 1/2 mile (2/4), 3 = 3/4 mile, 4 = 1 mile (4/4), L = loopback mode. ALLOWED: Yes. REQUIRED: Yes. DEFAULT: N/A.

            4. CLM=x - Cable length modulation (in quarter miles) and loopback information. VALUES: 0 = 0 mile, 1 = 1/4 mile, 2 = 1/2 mile (2/4), 3 = 3/4 mile, 4 = 1 mile (4/4), L = loopback mode.

            5. If CLD specified loopback mode, CLM must also be "L". If not loopback, CLM must be the same as CLD or it must be "4" (1 mile). ALLOWED: Yes. REQUIRED: Yes. DEFAULT: N/A.

            6. RED/BLK - Red/Black TDIM. VALUES: RED = Red TDIM (no TED) or BLK = Black TDIM (TED). ALLOWED: Yes. REQUIRED: Yes.

7. REP=Y/N - Repeater mode. VALUES: Y = Yes (repeater mode). N = No (non-repeater mode). ALLOWED: Yes. REQUIRED: Yes.

8 DIPHASE/DIPULSE - Diphase or dipulse modulation utilized. VALUES: DIPHASE = Diphase modulation. DIPULSE = dipulse modulation. ALLOWED: Yes. REQUIRED: Yes. DEFAULT: N/A.

9. RTS=A/B - RTS connection. VALUES: A = Connected to RTS A. B = Connected to RTS B. ALLOWED: Yes. REQUIRED: Yes.

10. NSYL=xxxxxxx - NSYLK output selection.

   a. Each x in the field represents the output selection for one NSYLK. That is first x is for NSYLK1, second x is for NSYLK2 ... seventh x is for NSYLK7.

   b. Each NSYLK supports the interface to 5 LKGs.

   c. NSYLK can interface either CS lines or dedicated lines to selected LKGs.

   d. VALUES: If output select is current TDIM, enough x's must be set with a T to support the number of circuit switch channels interface to an associated number of LKGs. If NSYLK output select is to a loop modem the x must be M. At least one x must be a T. ALLOWED: Yes. REQUIRED: Yes. DEFAULT: N/A.

NOTE: Show slide 21. Refer to TM 11-5805-790-12-5, para 6-43l.

(7) HMCB - Assign AN/TYC-39A relays.

   (a) Used to assign relay routing
     information for home and other
     AN/TYC-39A switches in the network.
   (b) Can be listed in any order.
   (c) Even though not a requirement a
     rule of thumb is to list your home
     switch first.
   (d) Can only list one relay for each
     community for each AN/TYC-39A
     switch.
   (e) Command Format: HMCB nnn Rxxx Uxxx
     Yxxx nnn Rxxx Uxxx Yxxx where:

     <u>1</u>. HMCB - Command mnemonic.
     <u>2</u>. nnn - Switch number. VALUES:
       1-126. ALLOWED: Yes.
      REQUIRED: Yes.
     <u>3</u>. Rxxx - R-Community relay.
      VALUES: any three letters.
      ALLOWED: Yes. REQUIRED: Yes.
     <u>4</u>. Uxxx - U-Community relay.
      VALUES: any three letters.
      ALLOWED: Yes. REQUIRED: Yes.
     <u>5</u>. Yxxx - Y-Community relay.
      VALUES: any three letters.
      ALLOWED: Yes. REQUIRED: Only
      if switch serves Y Community.
     <u>6</u>. Continue listing AN/TYC-39A
      switch numbers with their
      relays identifiers for the
      network.

<u>NOTE</u>: Show slide 22. Refer to TM 11-5805-790-12-5,
   para 6-43p.

 (8) HXTS - Used to allow an external
   (outside) the switch traffic service.
   This is very seldom used and is not a
   required command.

<u>NOTE</u>: Show slide 23. Refer to TM 11-5805-790-12-5,
   para 6-43m.

 (9) HRYR - Changes the R/Y ratio.

   (a) Indicates how many R to Y messages
     by precedence will be processed.
   (b) The command can be used to change
     the preset default values.
   (c) Not a required command as defaults

are preset.

(10) LADD/LMOD/LDEL

(a) LADDs are used to add new lines.
(b) LMODs are used to make changes to existing lines that have been previously defined using LADD.
(c) LDELs are used to delete lines.
(d) A rule of thumb to using LADD commands is to sequentially assign lines: line one, line two etc. This is not a requirement but helps ensure all lines are recorded.
(e) Various types of lines that interface with the home switch use a variety of LADDs. Check your diagram and information given to help choose or eliminate options to enable you to use the correct LADD.

NOTE: Show slide 24.

(f) Some items in the LADDs/LMODs will have these same parameters: Tnn MDnn LKGnn .... where:

1. Tnn - LTU number VALUES: 0 through 47. Must not equal the LTU number of any other active line. A rule of thumb is to use the same LTU, LKG, and modem number throughout a line. Not a requirement. ALLOWED: Yes. REQUIRED: Yes-LADD, No-LMOD. DEFAULT: N/A-LADD, Current value-LMOD. The LTU number field of the LADD/LMOD commands is unchanged.

2. MDnn - Modem number. VALUES: 0 through 47 for loop modem interface, and 99 for CS group modem interface. Must not equal the modem number of any other active line. ALLOWED: Yes. REQUIRED: Yes-LADD, No-LMOD. DEFAULT: N/A-LADD, Current value-LMOD.

3. LKGnn - LKG number. VALUES: 0

through 47. Must not equal
the LKG number of any other
active line. ALLOWED: Yes.
REQUIRED: Yes-LADD, No-LMOD.
DEFAULT: N/A-LADD, Current
value-LMOD.

NOTE: Show slide 25. Refer to TM 11-5805-790-12-5,
         para 6-43q.

         (g) LADD CS parameters.

              1.   TP - Trunk type. If a DTG
                   interface this entry will be
                   0. The other types, even
                   though available, are seldom
                   used since the introduction of
                   MSE equipment. This will be
                   the only CS interface
                   discussed in this course.
              2.   TR - Trunk number. Define the
                   lowest number first for a
                   trunk group. Does not have to
                   be defined as trunk 1 but is a
                   good rule of thumb.
              3.   LLnn - define the last trunk
                   number. If defining DTG
                   trunks this entry is only
                   required on the first LADD for
                   the circuit switch equate line
                   (CSEL) for the group. The
                   remaining lines will equate or
                   copy the classmarks from the
                   CSEL line.

NOTE: Show slide 26. Have students give you
         information to complete LADD on slide: LADD
         38 DA AL T38 MD38 LKG38 SP10 G0 CR MST DMC.
         Refer to TM 11-5805-790-12-5, para 6-43r.

         (h) LADD DA - Dedicated, data adapter,
              terminal line parameters.

              1.   DA -line type.
              2.   US/AL - United States or
                   Allied line classmark.
              3.   LTU, MD, LKG already
                   discussed.
              4.   SPnn - Loop speed 10 thru 14.
                    Loop speed 10 from note 1

indicates 2400 baud.

5. <u>5</u>. LKnn - Linked lines. More than one line going to the same destination can share classmarks from the first assigned line. This entry would be the first line number of a group.

<u>6</u>. Gn - Backlog group. Defines how many messages will be backlogged before they are placed in the SDU overflow file for later delivery. May or may not be a required field depending on whether the line is first linked, linked, or not linked.

<u>7</u>. Cxxx - Communities served (R, U, Y) but no more than allowed by information worksheets.

<u>8</u>. SLV/MST - Slave or Master. Switch should be programmed for the opposite of what is programmed at the other end of the line. Sets up which end controls the interface between the DA circuits.

<u>9</u>. ST/NT - Satellite or normal timing.

<u>10</u>. AT - AUTODIN access line

<u>11</u>. DMC - Data Mode Control.

<u>NOTE</u>:   Show slide 27. Have students give you information to complete LADD on slide: LADD 26 M2 US T26 MD26 LKG26 SP5 G0 CR A5 CN FS SM1. Refer to TM 11-5805-790-12-5, para 6-43s.

(i)   LADD Mn - Dedicated, conventional, terminal line.

<u>1</u>.   M (1 through 5) - Mode.

<u>2</u>.   U.S/AL already discussed.

<u>3</u>.   LTU, MD, LKG already discussed.

<u>4</u>.   SPnn - already discussed.

<u>5</u>.   LKnn - already discussed.

<u>6</u>.   Gn - already discussed.

<u>7</u>.   Cxxx - already discussed.

<u>8</u>.   XTS - used if this line will

support an external traffic
service. Seldom used and not
required.

8.   Jn/An - Format; either JANAP
128 or ACP 127; 5 or 8-level
code.

9.   Rn - number of RIs per
delivery. Defaults to 50 if
entry is not changed.

10.   BS/CN - Transmission mode.

11.   AS/FS - Abbreviated or full
SOM sequence.

12.   ST/NT - already discussed.

13.   SM - Number of stop bits.

14.   IO/OO - Input only to receive
messages/data or output only
to transmit messages/data.

15.   YI/AT - IDDF/AUTODIN access
line (special terminal).

16.   SB - Short Block Capable.

17.   RSEC=X - R community security.
 If security of line is not
set at this time, no router
command can be higher than the
default value of
"UNCLASSIFIED."

18.   USEC=X - U community security.

19.   ECP - Emergency command
precedence authorization.

20.   NS3 - NATO supplement 3.

NOTE: Show slide 28. Refer to TM 11-5805-790-12-5,
para 6-43t.

(j) LADD SD parameters.

1.   Used to define MS to MS trunk
that is using a data adapter
interface.

2.   All of the parameters have
been discussed in previous
LADD commands.

NOTE: Refer to TM 11-5805-790-12-5, para 6-43u.

(k) LADD SF parameters.

1.   Used to define conventional MS
to MS trunk.

2.   All of the parameters have

been discussed in previous
LADD commands.
NOTE: Refer to TM 11-5805-790-12-5, para 6-43v.

       (l)   LDEL parameters.

           1.   Used to delete any active real
                 line.
           2.   This command will be used
                 during the next lesson.

NOTE: Refer to TM 11-5805-790-12-5, para 6-43x thru
         6-43 6-43ab.

       (l)   LMOD parameters.

           1.   Used to modify or change a
                 line.
           2.   When used this command
                 requires a line number and the
                 new parameter. If a parameter
                 is not being changed no entry
                 is required.
           2.   This command will be used
                 during the next lesson.

NOTE: Show slide 29. Refer to TM 11-5805-790-12-5,
         PARA 6-43, PG 6-62.

      (11) RADD/RMOD/RDEL

         (a) RADD defines a new router for a
              line. Some RADD commands require a
              two-line entry: the RAD* command
              will be used on the 2d or
               continuation line.
         (b) RMOD is used to make changes to a
              router that has been already
              defined using RADD. RMO* is used
              to modify items on continuation
              line.
         (c) RDEL is used to delete a router.
         (d) Various types of lines and routers
              that interface with the home switch
              use a variety of RADDs. These
              RADDs will closely follow
              classmarks set in the associated
              LADD. Check your diagram and
              information sheets given to help
              choose or eliminate options to

enable you to use the correct RADD.

       (e) RADD EQ - Equate or copies some parameters of an RI to another RI.

          1. When a router is equated to another router the new RI receives on a permanent basis the identical handling of the original RI. The parameters of the new RI can no longer be individually controlled.

          2. Useful when assigning more than one RI to a line. The first or primary RI would be defined and the remaining RIs would be equated to the primary. This works with switch relay, progressive, and terminal RIs.

          3. Some routers are automatically generated and equated in the routing tables during switch initialization. Examples are traffic service RIs: R...CS, U...CS, Y...SV. These routers automatically equate to the prime RI.

          4. Command is EQ - Equate.

       (f) RADD LT - Define a new local terminal RI (basic). Command parameters are:

          1. LT - Local terminal, dedicated or switched thru a circuit switch.

          2. OAS - Other automatic switch indicator.

          3. RE - Relay type (1 = Y community, 0-5 = R/U community. Normally set for 1 for Y and 5 for R/U. Defines the relay type by showing how

many characters of the RI in the message header will be needed to route on the home site.

4. Connection type: DC - Dedicated conventional; DD - Dedicated data adapter; SC - Switched conventional; SD - Switched dedicated.

5. LNN/? - LNN represents associated line number of terminal or use ? to indicate messages for this RI are to be routed to the limbo line.

6. Innn - international Access Code - part of phone number.

7. National Area Code - part of phone number.

8. Subscriber address - part of phone number.

NOTE: Show slide 32.

9. Dn - DTE number.
10. SEC - Security pro-sign.
11. LMF - Terminal language media format.
12. IO - Input-only Terminal.
13. Cnnn - Teletype line size 69 or 80 characters.
14. * - Continuation indicator that indicates that a second line beginning with RAD* is to follow. Cannot be a dedicated conventional line.

NOTE: Show slide 33. Refer to TM 11-5805-790-12-5, PARA 6-43ak.

(g) RAD* ...Annn. Define a new local terminal RI (CS/DA extension). Used as second line of command RADD LT and RADD RT that requires a continuation line. Command parameters are as follows:

1. RAD *
2. Routing indicator - same as RI entered in the RADD line; this is a check.

3. Annn - ASDI code.
4. CSTTY = Y/N - CSTTY type terminal.
5. Mn - MODE 1 or 6.
6. BS/CN - Transmission.
7. ECn - Error Control: multisampling or golay codes.
8. FR=x - Framing.
9. IRnn - Information rate.

NOTE: Show slide 34.

10. DMC - Data mode control.
11. DT=xxxxx = Data adapter DTE type.
12. STR - Mode VI storage.
13. HRxnnnnn = Half rate defaults. Only allowed if your switch is set for 32kb and affects lines/routers interfacing with a 16kb CS.
14. ECP - Emergency command precedence authorization.
15. CD = xxx. Channel designator/terminal ID.
16. SM - Service message RI. Defines what router is to receive any service messages in reference to the defined RI.
17. NS3 - NATO SUPP 3.

NOTE: Show slide 35. Refer to TM 11-5805-790-12-5, PARA 6-43ag.

(h) RADD...RT. Define new remote terminal RI (basic).

1. A remote terminal is basically the same as a local terminal, except that it is connected as a terminal to a primary or connected relay (SF or SN) rather than to the home switch.
2. This RADD RT is very similar to the RADD LT. We will only discuss the parameters that are different.

    a.   RT - Remote terminal.

    b.   Rxxx/Uxxx/Yxxx/? -
           associated progressive RI
           (distant switch relay) of
           terminal or ? to indicate
           messages are to be routed
           to the limbo line.

    c.   DC/DD/SC/SC - Connection
           type for a RT. Refers to
           its potential classmarks
           or those it will assume
           if it is modified to LT.

NOTE: Show slide 36. Refer to TM 11-5805-790-12-5,
          PARA 6-43ag.

    d.   Gnn - remote dedicated DA
           group number. Used to
           associate RIs served by
           one DA if the RTs become
           LTs associated with a
           particular line. Again
           this is a potential
           classmark.

    e.   The RAD* used to continue
           the RADD LT and the RADD
           RT continuation line.

NOTE: Show slide 37. Refer to TM 11-5805-790-12-5,
          PARA 6-43aj.

    (i) RADD...US. Define a new user RI.

    1.   This command defines an RI
           that will become a user of an
           already existing RI. Do not
           confuse with equate RIs. This
           command can be used for a
           relay that does not have the
           same line characteristics as
           the existing RI.

    2.   The term "user" refers to a
           subscriber who uses the
           terminal facilities of another
           and does not have his own
           equipment. A user may be
           either a roving subscriber who
           does not carry a terminal or a
           non-roving subscriber who uses
           another subscriber's terminal
           but who requires individual

control.

    (j) RADD ...PA. Define a parent relay.

     <u>1</u>. The home site parent relays are defined in the HMCB command. However a varying number of message switches can also be parent to the same designator. This capability is necessary for proper routing of individual RIs that rove within the particular network.

     <u>2</u>. The key point for using the RADD PA is that, if you specify a relay RI as parent, you must include in some routing table (LT, RT, or US) all RIs in the network that share that same relay.

     <u>3</u>. The AN/TYC-39 IS NOT the parent of a relay designator when none or only some of its individual RIs are defined in the table.

     <u>4</u>. Be extremely careful when using this RI command. Can affect message delivery in the entire network.

    (k) RADD ...SF/SN. Define a new primary/nearby switch relay (basic).

     <u>1</u>. SF refers to directly connected relay interface - MS to MS.

     <u>2</u>. SN refers to not directly connected relay interface for relays that are connected via one or more message or circuit switches even though they could potentially be directly connected.

3. Normally define the R
community relay RI of the
distant switch that has been
defined under the "site
relays" command HMCB. The U &
Y relay RIs will be
automatically equated.

4. Do not define/enter the home
site relays (the switch for
which you are defining the
data base).

5. RAD*...DD second line is used,
if needed, for continuation
line for RADD SF/SN.

NOTE: Refer to TM 11-5805-790-12-5, para 6-43ai.

(l) RADD...SR. Define a new remote
switch relay.

1. Identifies the RI of a relay
that can only be reached via
an SF or SN relay.

2. This relay must have been
defined in the HMCB.

3. Normal procedure is to define
the R community RI. The U and
Y community RIs that were
listed in the HMCB command
will automatically be entered
as equates.

NOTE: Refer to TM 11-5805-790-12-5, para 6-43am.

(m) RDEL - Deletes an RI.

An RI may not be deleted if it
will cause any table-generated
RI(s) to become undefined.

NOTE: Refer to TM 11-5805-790-12-5, para 6-43as,
at, au, av, aw, ax and ay.

(n) RMOD EQ, RMOD LT, RMOD PA, RMOD RT
RMOD SF/SN, RMOD SR, and RMOD US -
Modify RI commands.

1. Not all fields are required
when making modifications.
Normally only those that are

to be changed; insert new
                                    value.

                               2.   Continuation RAD* commands
                                    require RMO* commands when
                                    changes are to be made to 2d
                                    line of command.

NOTE: Show slide 39. Refer to TM 11-5805-790-12-5,
          para 6-43ac.

          (12) LRIS - Assign special routing indicators
               to a line.

               (a) Defines router to receive service
                    messages for a line if not
                    previously defined under
                    RADD/RAD*..
               (b) Any router that has a two-line
                    RADD/RAD* would have service
                    message (SM) router defined in the
                    command and cannot use LRIS.
               (c) Any router defined with a one-line
                    RADD does not contain the SM
                    router. If the SM router is not
                    defined under LRIS, all SMs
                    relating to that router will be
                    delivered to the traffic service
                    position.

NOTE: Show slide 40. Refer to TM 11-5805-790-12-5,
          para 6-43bj.

          (13) SEC TCAs - Assign transmission control
               code (TCC) authorizations to an RI.

               (a) Y community RI only.
               (b) Cannot be a collective or TYC-39A
                    switch relay.

NOTE: Show slide 41. Refer to tm 11-5805-790-12-5,
          para 6-43bb.

          (14) SEC LINE - Change security of a line.

               (a) May not serve Y community only.
               (b) Need to keep in mind the security
                    levels of the RIs this line will
                    serve.

NOTE: Show slide 42. Refer to tm 11-5805-790-12-5,

para 6-43bc.

(15) SEC RI - Change security of an RI.

    (a) Change security of R/U community RI
          on lines. Normally security is set
          in the RADD commands, but this
          command can change what was done.
    (b) Cannot be higher than the
          associated line that the RI uses.
          Security level of RI can be lower
          than the security level of the
          line.
    (c) Also used to changes security of
          traffic service (TS) RIs to Top
          Secret.

        1.   TSP defaults to R/U community
             confidential.
        2.   Must assign for TS to handle
             any R/U traffic above
             confidential.

NOTE: Show slide 43. Refer to TM 11-5805-790-12-5,
paras 6-43bl and bm.

(16) SEC TRA - Add transmission release code
     (TRC) authorization to a line.

    (a) Each TRC code is a single
          alphabetic character authorizing
          delivery to one or more foreign
          nations.
    (b) May not service Y-community ONLY.
    (c) Associated command SEC TRD is used
          to delete TRC authorizations from a
          line.

NOTE: Show slide 44. Refer to TM 11-5805-790-12-5,
para bd, be, and bf.

(17) SEC SRA LINE, SEC SRA RI, and SEC SRA
     TSS - Commands to add SPECAT/SHD
     authorizations to lines and routers.

    (a) R/U communities only.
    (b) Not needed for trunks.
    (c) TSP defaults to SPECAT/SHDS=NONE.
          Command is required to allow SPECAT
          for traffic service.

(d) If not defined, line may not handle that level of SPECAT traffic.
(e) Associated commands to delete SPECAT/SHD: SEC SRD LINE, RI, and TSS.

NOTE: Show slide 45. Refer to TM 11-5805-790-12-5, para 6-43a.

(18) CADDs - Add collective RIs.

(a) Defined by their unique relays with CR as the 3 & 4 character.
(b) RIs must be previously defined and all of the same community.
(c) All members must have at least the minimum security level of the collective.
(d) Members must all have the same TRC and TCC codes.
(e) Define as many RIs that can be included on line of 80 characters. Any additional RIs for that list can be added using CARI command.
(f) CDEl is used to delete a collective RI.

NOTE: Show slide 46. Refer to TM 11-5805-790-12-5, para 6-43f.

(19) CDRT - Define critic deterministic routes.

(a) Required command when home site services Y-community.
(b) Allows three deterministic (not switched) routes for critic messages. All three routes must be defined can be different or the same relay or router.

NOTE: Show slide 47. Refer to TM 11-5805-790-12-5, para 6-43h.

(20) CSST - Define list of RIs to receive statistical (STAT) messages.

(a) Sets up routers to receive list of supervisory messages generated when using STAT commands.

(b)　Up to 8 RIs can be defined.
　　　　　　　(c)　RIs in the list must be the same
　　　　　　　　　 community.
　　　　　　　(d)　Two separate CSST commands can be
　　　　　　　　　 made:　one for Y community, one for
　　　　　　　　　 R or U community.

　　NOTE:　　Show slide 48.　Refer to TM 11-5805-790-12-5,
　　　　　　　para 6-43c.

　　　　　　(21)　CDSP - Define RIs to receive database
　　　　　　　　　 display messages.

　　　　　　　(a)　When the supervisory display is
　　　　　　　　　 placed in the display mode and a
　　　　　　　　　 query of "SEND" is chosen, this is
　　　　　　　　　 the command that will list the RIs
　　　　　　　　　 to receive this display screen in
　　　　　　　　　 the form of a message.
　　　　　　　(b)　R community RI only.
　　　　　　　(c)　Can list up to 8 RIs which can
　　　　　　　　　 contain a collective RI

　　NOTE:　　Show slide 49.　Refer to TM 11-5805-790-12-5,
　　　　　　　para 6-43g.

　　　　　　(22)　CRRP - Lists RIs to receive network
　　　　　　　　　 control routing reports.

　　　　　　　(a)　Routing reports are generated when
　　　　　　　　　 certain commands are performed in
　　　　　　　　　 the AN/TYC-39A.　Certain personnel
　　　　　　　　　 such as the system planner or
　　　　　　　　　 network controller use these
　　　　　　　　　 reports to keep track of what is
　　　　　　　　　 happening in the network.
　　　　　　　(b)　These reports will be delivered to
　　　　　　　　　 routers that have been predefined
　　　　　　　　　 under this command when the AN/TYC-
　　　　　　　　　 39A is brought to the on-line
　　　　　　　　　 state; cycle stall removed.
　　　　　　　(c)　Up to 8 R community RIs can be
　　　　　　　　　 listed.　An RI can be a collective
　　　　　　　　　 RI.

　　NOTE:　　Show slide 50.　Refer to TM 11-5805-790-12-5,
　　　　　　　para 6-43ao and ap.

　　　　　　(23)　REIN ADD/REIN ADD ALL - Defines RIs to
　　　　　　　　　 receive reintroduction of messages.

(a) Can be used for an individual or a
                                   community RI.
                              (b) Is activated when on-line
                                   supervisory commands GORN or GORN
                                   ALL are used to divert messages to
                                   an alternate destination that has
                                   been defined using the REIN
                                   commands.
                              (c) Associated commands to delete the
                                   RIs to receive reintroduced
                                   messages are REIN DEL and REIN DEL
                                   ALL.
9H 57M

          4.   Practical exercise. During the practical
               exercise, observe the students on their ability to
               perform the learning objective; coach, if
               necessary. Have students work in teams when
               developing database in classroom and with personal
               computer. Have two students work together on
               equipment during the AN/TYC-39A hands-on portion
               of the practical exercise.

     NOTE: Show slide 51 or 52. These are the networks
               that are contained in the students' practical
               exercises. You will need to tell them which
               network and site diagram to use to create
               their databases.

          a.   Explanation to students.

               (1) During the practical exercise you will
                    use an operational AN/TYC-39A; TM 11-
                    5805-790-12 series; floppy disks and
                    practical exercise, 260-ASIZ2/C01-LP3-
                    PE. In Part One you are required to
                    write security and line classmark,
                    create personal computer files, data
                    base disks (DBD), and program load disks
                    (PLD) using VTOF and off-line TGEN
                    commands. You will have 3 hours to
                    create databases and 4 hours to VTOF and
                    validate and create your final PLD.
               (2) Have your instructor evaluate your
                    performance after each exercise has been
                    successfully completed.
               (3) If what you are required to do is not
                    clear, ask your instructor for
                    clarification.

b.   Application by students.

        Using the AN/TYC-39A and personal
        computers, the students will write
        security and line classmark databases,
        enter them into computer files, perform
        VTOF within 3 hours and TGEN procedures
        to create final PLD within 4 hours.

c.   Evaluation. During the practical exercise,
      evaluate each student to ensure they have the
      ability to determine the correct procedure to
      write security and line classmark databases,
      use VTOF procedures within 3 hours and TGEN
      procedures within 4 hours.

39H 57M

SUMMARY:

        In this lesson, we discussed the AN/TYC-39A data
        base commands. We looked at the security and line
        classmark procedures. You created your own
        security and line classmark PLDs using information
        discussed in this lesson. The information you
        received in this lesson, combined with your prior
        knowledge of message switch data base, will enable
        you to perform your job in the AN/TYC-39A.

40H

                              END

This document supports Task Number 113-113-583-1023, 113-583-
2618, and 113-583-2620.

LESSON PLAN

TITLE: On-line Table Generation

LEARNING
OBJECTIVE: <u>Action:</u>   The student will perform on-line
                               AN/TYC-39A data base procedures.

              <u>Condition:</u>   The student is given
                               TM-11-5805-790-12 series, an
                               operational AN/TYC-39A and a 3.5
                               double-sided, high density DBD
                               floppy disk.

              <u>Standard:</u>   Acceptable performance is achieved
                               when the student can read and write
                               a DBD floppy and correctly prepare
                               and enter on-line data base
                               commands within 45 minutes and
                               correctly answer 14 of 20 within 60
                               minutes.

SAFETY
CONSIDERATIONS: There are no safety considerations for this
                    lesson.

RISK
ASSESSMENT: Low.

RESOURCE
NEEDS/
REFERENCES: AN/TYC-39A, TM 11-5805-790-12 series, and 3.5
                DS/HD diskette.

METHODS OF
INSTRUCTION: Conference and Practical Exercise

TIME: 6 Hours

INSTRUCTOR NOTES:

                Ensure that the classroom is available and
                properly set up and that all equipment and
                training resources are available and in working
                order.

INTRODUCTION:

Elapsed   1.   To successfully operate the AN/TYC-39A, you need a
Time   good working knowledge of data base commands and
                procedures. In the previous lesson you began your
                data base foundation by learning off-line data
                base procedures. We will build on this foundation
                in this lesson.

           2.   During this lesson, we will study the procedures
                for reading and writing a DBD file on-line and the
                commands to enter on-line data base classmarks.

BODY:

           1.   Off-line and On-line TGEN comparison.

                a.   TGEN provides the means to initialize and/or
                     modify parts of the site-specific data base.

                b.   The function is available off-line and
                     on-line.

                c.   Off-line is the preferred method to create or
                     modify the site-specific data base classmarks
                     and produce a new PLD containing all the
                     programs and the newly generated/updated data
                     base. While operating in an on-line state
                     the constantly changing network can make it
                     impossible to change the data base in the
                     off-line mode.

                d.   Most of these same data base parameters can
                     also be created/modified on-line. Some
                     restrictions will apply and will be discussed
                     in this lesson.

                e.   Some commands can only be created off-line.

                     (1) H T.
                     (2) HCSP.
                     (3) HXTS.

                f.   Off-line PASS cannot be used to add or change
                     the DATE password "JXXXX$. Can only be done
                     on-line.

                g.   The off-line and on-line TGEN commands are
                     entered via the VDT or DBD.

      h.   To use a DBD on-line it must have been previously generated:

           (1) By the on-line DBD generation function (GOST)
           (2) Or by the off-line VTOF utility job.

QUESTION: What functional password can only be changed on-line? (ANS: The data change password, Jxxxx$)

2.   DBD write/read procedures.

  NOTE: Refer to TM 11-5805-790-12-3, para 5-28.

      a.   On-line TGEN commands are recorded in memory and on the control SDU for recovery; not on the PLD.

      b.   The on-line DBD generation function GOST can be used to record all on-line data base changes to a DBD file.

           (1) It is recommended that GOST be active at all times provided an FDD is available to record the changes.
           (2) The major reason for active GOST is for creating an on-line DBD file which will be used for input to off-line TGEN to update the PLD.
           (3) Another is in case a system recovery does not work and DINLed SDUs are used. The DBD can be read into the on-line system to obtain changes not recorded on the PLD.

                (a) If security section data base commands are written to the on-line DBD, then a security user type must read those command numbers back in to the system.
                (b) The line classmark commands are read back in by a ADMIN/SUPERVISOR user type.
                (c) If security and line classmark commands are mixed on one DBD floppy, they will have to be read back in by the correct user type and by number.

c.   If it is not possible to use GOST to write to on-line DBD:

   (1)   The data base command numbers can be located in the acknowledge (ACK) printouts and the DBD close printouts.
   (2)   These printouts will assist the operator in identifying the commands which have not been recorded on the DBD.
   (3)   Minimizes the effort involved in updating PLD using off-line TGEN.

d.   DBD open/close commands.

   (1)   GOST - Allows data base generation (TGEN) commands to be written to a DBO file on the DBD. In order to use this command the diskette must be formatted.

      (a)   The FDD must be at available for on-line use - +C or +D.
      (b)   A DBD disk must be inserted into the FDD to be used.
      (c)   This GOST command may be entered by user types SSO and ADMIN/SUPE. The user type required will depend on whether security or line classmarks or being created/modified.
      (d)   GOST places the FDD in the WD state.

         1.   The TGEN commands are stored in a buffer and written to a DBO (data base output) file after every 10 records or when the GOST function is closed by NOST.
         2.   To ensure that all records are stored on the DBD the status of the FDD should be watched closely; must be at WD state.
         3.   The FDD can "error close" while TGEN commands are being entered.
         4.   If a FDD is not available for the GOST function, the NDA alarm and NO FDD printout will occur.

(2) NOST.

                         (a) This command may be entered by
                              security and ADMIN/SUPE user types.
                         (b) Terminates GOST.
                         (c) Records on the DBD file any TGEN
                              commands under the 10 record limit.
                         (d) Causes automatic close of active
                              DBO file on the DBD floppy, if any.

     NOTE: Refer to TM 11-5805-790-12-3, para 5-25j.

          e.   DBD read commands allows a data base input
               (DBI) file to be opened and commands read
               into the on-line system.

               (1) The reading of a DBI (data base input)
                    file can be accessed by security and
                    ADMIN/SUPE.
               (2) A DBD floppy must be inserted into a
                    floppy drive which is at the
                    unavailable; not assigned to on-line:
                    -C or -D state.
               (3) Perform "Open DBI i"

                         (a) The SUPE command, RICH, must be
                              used if the TGEN command input
                              device is a DBI file on a DBD
                              floppy.
                         (b) If any passwords are required for
                              the security or line classmarks
                              TGEN commands on the DBD, they must
                              be included in this RICH command.
                         (c) The RICH command must also be used
                              to specify the passwords required
                              for a TGEN command which is input
                              from the VDT.
                         (d) In other words, the only TGEN
                              commands which may be entered
                              without the RICH command are VDT
                              input commands which require no
                              passwords.

     QUESTION: Can you perform on-line TGEN commands without
               a DBD? (ANS: Yes, but not the preferred
               method.)

3.　RICH command procedures.

    a.　This command may be entered by user types SSO and ADMIN/SUPE depending on whether the security or line classmarks are being read from DBI or written to DBO.

    b.　To specify input parameters and passwords for data base generation, the following command "RICH is used along with some or all of the functional passwords. RICH i(nnnn) Mxxxx$ Sxxxx$ Exxxx$ Xxxxx$ Txxxx$ Axxxx$ Yxxxx$ Dxxxx$ Jxxxx$ where:

RICH	=	Command Designator.
i(nnnn)	=	Input to follow from:
V	=	VDT.
D	=	Data base Device.
Dnnnn	=	Data base device starting with Record Number nnnn.
Mxxxx$	=	Master Password (four printable characters).
Sxxxx$	=	Security Password (four printable characters).
Exxxx$	=	ECP Password (four printable characters).
Xxxxx$	=	SPECAT/SHD Password (four printable characters).
Txxxx$	=	TRC Password (four printable characters).
Axxxx$	=	ALLIED/US Password (four printable characters).
Yxxxx$	=	SPECAT/SHD or Y Community Text Print Password (four printable characters).
Dxxxx$	=	Memory or SDU Dump Password (four printable characters).
Jxxxx$	=	Date and Time Change Password (four printable characters).

    c.　The RICH command has two functions.

        (1)　Specifies the input device for TGEN commands and, if input DBD file, the first record to be read.

        (2)　Enters the required passwords if Password, Security, ECP, SPECAT/SHD, TRC Authorization, and/or ALLIED/US classmark changes are to follow.

(3) If DBD (D) is specified as the input device, a data base command input device must currently be open.
(4) If no record number is provided, the input begins with the first records on the device.
(5) TGEN commands will be read and processed (usually one command per record) from the DBD (FDD = RD) until either:

    (a) An error is detected in one of the commands
    (b) An end-of-file indicator /& is encountered
    (c) Or a block cannot be read. In this last case, the message "UNABLE TO READ BEYOND RECORD # xxxxxx" appears on the printer.

(6) If VDT (V) input is specified and passwords are required, a second line consisting of one TGEN command will follow.

    (a) This means that 2-line commands inputted from the VDT such as RADD/RAD* and RMOD/RMO* cannot be used with the RICH command.
    (b) They can be inputted without the RICH command as long as no fields are included which required passwords; for example, security.
    (c) That is, sometimes two steps are required.

        <u>1</u>. Enter a 2-line command without password-type fields.
        <u>2</u>. Enter the RICH with password and second command (one line) for the password-type field. Some examples of commands that may be used to assist are LMOD, RMOD, RECP, SEC LINE, and SEC RI.

         (d)   If a master password (Mxxxx$) is
               specified:

              <u>1</u>.   Normally no other passwords
                    are required.
              <u>2</u>.   Exception: If a TGEN PASS
                    command is to be used to
                    change the value of one or
                    more predefined functional
                    passwords, the current value
                    of each password to be changed
                    must appear in the RICH
                    command line.

<u>QUESTION</u>: Is a RICH command required on-line when
             reading a DBI file? (ANS: Yes.)

4.   ACK/NAK line and error notifications.

    a.   The ACK/NAK line on the VDT and printer
          contains the data base command numbers
          assigned as a result of the commands
          processed. This additional information
          appears as follows:

               NONE
               DB CMD #(S) ASSIGNED: nnnn

               Standard ACK/NAK information nnnn to
               mmmm where:

               NONE =   No valid DB commands entered
               nnnn =   First or only DB command
                       number assigned
               mmmm =   Last DB command number
                       assigned

    b.   Two-line commands (RADD/RAD*, RMOD/RMO*)
          result in one DB command number. Range of
          command numbers can only occur for DBD input.

          (1)   In additional to the NAK response on the
               VDT, a command error is indicated on the
               printer in the following format:

               (line 1) command record
               (line 2) *
               (line 3) error message RECORD # =
                       nnnnnn

(a) Line 1 is simply the command in which the error is detected, with any passwords overlaid with dollar signs ($).

(b) Line 2 contains a single asterisk * in the character position at which the command scan first detected an error.

    <u>1</u>. Usually (but not always), this is directly below the field that has the error.

    <u>2</u>. An asterisk beneath character one of the command means that the error was not noticed until after all the fields were scanned.

(c) Line 3 consists of a brief message describing the type of error and the number of the record in error (only appears if DBD input).

(d) This should be familiar from your work with the off-line TGEN.

(2) If an error is detected on-line while attempting to read a DBI file (either in the RICH D command or in one of the DBD command records), the DBD is closed.

(a) If the operator wants to resume processing the DBD, it must first be reopened by entering the OPEN DBI and RICH D commands must be reentered.

(b) The DBD processing will start at the beginning of the file unless the specified the record number of the next command desired in the RICH D command.

(c) Operationally, any commands which were accepted prior to the error indicated by the record number in the error printout should be bypassed if the DBD file is entered more than once.

(d) This will prevent the possibility of additional errors resulting from data base changes which have already been implemented.

(e) In the case of two line command, a
     command error in the first of two
     command lines causes the second
     line to be ignored. An error in the
     second line causes changes
     specified in the first line not to
     be affected.

QUESTION: Where in the message switch can you find the
          on-line TGEN error notifications? (ANS: NAK
          on the VDT; error messages on the SUPE LPU.)

1H 58M

5. Practical exercise. During the practical
    exercise, observe the students on their ability to
    perform the learning objective; coach, if
    necessary. Have two students work together on
    equipment during the practical exercise. Students
    awaiting or having completed hands-on training
    will complete the written portion of the practical
    exercise.

    a. Explanation to students.

        (1) During the practical exercise you will
             use an operational AN/TYC-39A; TM 11-
             5805-790-12 series; A DBD floppy and
             practical exercise, 260-ASIZ2/C01-LP4-
             PE. In Part One you are required to
             perform DBD read and writes functions
             and prepares and enters on-line TGEN
             commands. You will have 45 minutes to
             perform these tasks. In Part Two of the
             practical exercise you will answer 20
             written questions within 60 minutes.
        (2) Have your instructor evaluate your
             performance after each exercise has been
             successfully completed.
        (3) If what you are required to do is not
             clear, ask your instructor for
             clarification.

    b. Application by students.

        (1) Using the AN/TYC-39A with DBD floppy and
             practical exercise 260-ASIZ2/D01-LP4-PE,
             the students will perform DBD read and
             writes functions and prepares and enters
             on-line TGEN commands within 45 minutes.
        (2) The students must correctly answer 14 of
             20 questions within 60 minutes.

       c.   Evaluation. During the practical exercise, evaluate each student to ensure they have the ability to determine the correct procedure to read and write DBD floppy and to prepare and enter on-line TGEN commands within 45 minutes and are able to correctly answer 14 of 20 questions within 60 minutes..

5H 57M

SUMMARY:

       In this lesson, we discussed the AN/TYC-39A on-line data base procedures. We discussed the differences and similarities of off-line and on-line data base. We looked at the DBD and TGEN command procedures. The information you received in this lesson, combined with your prior knowledge of a message switch data base, will enable you to build a data base during your future AN/TYC-39A duty assignments.

6H

END

This document supports Task Numbers 113-583-2617 and 113-583-2620.